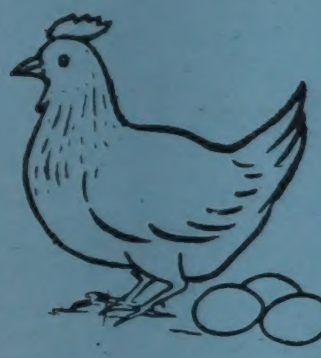
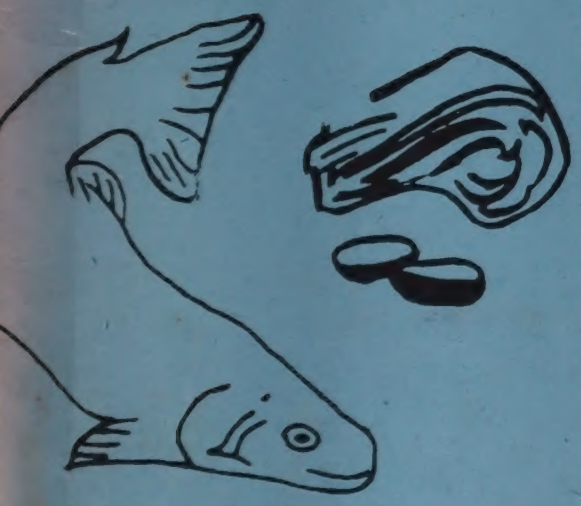
FOOD PREPARATION HANDBOOK

ILY FOOD NEEDS

L K

ving child : 2 - 5 cups
ectant - nursing
hers : 4 cups
rs : 1 - 2 cups





OTEIN FOODS

ryone : 2 or more servings
ese, dried beans, eggs, fish,
ils / pulses, meat, nuts, poultry

TS, SWEETS

ryone : very, very little

CEREALS AND BREADS

everyone : 4 or more servings
bajra, barley, chana, jawar, maize
oats, ragi, rice, wheat

FRUITS AND VEGETABLES

everyone : 4 or more servings
choose most from dark green and deep yellow
fruits and vegetables, and citrus fruits

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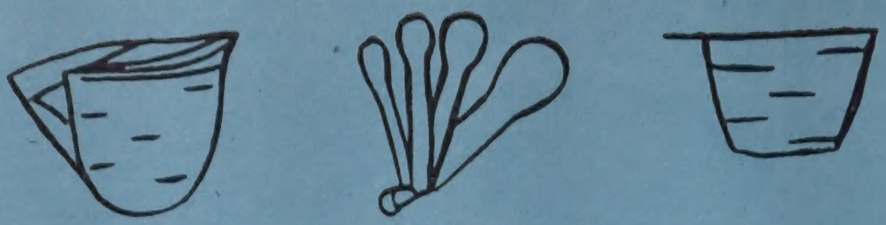

Standard Cup	Standard Spoon	Contents (ml)
1	50	250
4/5	40	200
3/5	30	150
1/2	25	125
2/5	20	100
1/5	10	50

1 Standard Cup is equivalent to : 1.056 of the U. S. standard cup, 236.55 ml or 8 ounces.
0.88 of the U. K. standard cup, 283.50 ml or 10 ounces.
the same as Sweden's standard cup

1 Standard Cup = grams			
butter	220	ragi	180
dal	200	rice	
flour		long grain	191
maida	121	medium grain	200
whole wheat	126	parboiled	199
milk		short grain	210
buffalo	243	sooji	
cow	246	coarse	250
dry skim	131	fine	160
dry whole	265	sugar	
sweetened condensed	321	brown	223
oil		icing	129
gingelly	220	white	160
ground nut	222	vanaspati	215
peas, dry	190		20

1 Standard Spoon = gram	
baking powder, SAS	3.5
bicarbonate of soda	4.4
cocoa	4.72
cornflour	2.68
cream of tartar	3.4
gelatin, plain granules	3.14
maida	2.40
sugar, white	3.2
salt, table	4.10

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FOOD PREPARATION HANDBOOK

First Edition

Published for

THE HOME SCIENCE ASSOCIATION OF INDIA

by

MARYANNA S. CASSADY

FOOD PREPARATION HANDBOOK

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Preface

The idea of standardizing terminology and measurements for home use was conceived as the eighth Biennial Conference Programme Committee discussed the needs of the Home Science Association of India, of Indian homemakers, of all those involved with providing consumer goods and services to the homemakers, and to institutions of home science education and research.

The Food Preparation Handbook is the first to be prepared. It contains facts and figures from many sources, the purpose being to provide a reference book for all who work with foods, and to promote uniform usage of terminology, measurements, time and temperatures.

At the same time a standard cup and standard spoon have been established and put on the market. This handbook contains information about the standard cup and standard spoon, how they compare with Imperial and United States measures, and some suggestions regarding how to alter recipes to fit these measuring devices.

Much has been done and much remains to be done in research with regard to food and recipes.

The Standardization Committee requests suggestions, standardized recipes and copies of, or references for related researeh, be sent to either of the Co-Unit Chairmen. Anyone desiring to carry out research may refer ro our research articles and may feel free to correspond with us. The HSAI welcomes assistance and independent research.

Many people have assisted, either directly or indirectly, in planning and preparing the Handbook. Mr. Rao and Mr. Kapoor of the Indian Standards Institution have prepared a proposed Standard for the cup and spoon. Mr. C. V. Chandra Sekhar of T. T. Private Ltd. contributed pressure cookers for the research and is producing the standard cup and spoon sets. Dr. Mrs. R. P. Devadas has offered encouragement and suggestions since the inception of the Committee and reviewed the handbook plan. Mrs. K. G. Kamalanathan and Miss M. A. Nalini carried out the research. Mrs. Kamalanathan helped to plan the handbook. Miss Nalini reviewed the plan. Miss T. Padmasini Asuri assisted with the cup and spoons. The Executive Committee of the HSAI continues to offer guidance and support. Mrs. Ian Andersen typed the manuscript.

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Converson Tables

ABBREVIATIONS

Length :

centimetre	– cm
foot	– ft
inch	– in
metre	– m
millimetre	– mm
millimicron	– mc

Temperature :

degrees Centigrade	– °C
degrees Fahrenheit	– °F

Time :

hour	– hr
minute	– min
second	– sec

Volume :

barrel	– ba
bushel	– bu
cubic centimetre	– cc
cup	– C
fluid	– fl
gallon	– gal
hectolitre	– hl
litre	– l
millilitre	– ml
ounce	– oz
pint	– pt
quart	– qu
peck	– pk
standard spoon	– S
tablespoon	– T
teaspoon	– tsp

Weight :

chattock	– ch
gram	– g
Imperial	– Imp
kilogram	– kg
microgram	– mcg
milligram	– mg
ollock	– o
ounce	– oz
pao	– p
pound	– lb
seer	– se
United States	– US

All abbreviations are used in singular form regardless of the quantity they represent.

STANDARD CUP AND SPOON

1 C = 250 ml water
1 S = 5 ml water

Cup	Spoons	ml
1/5	10	50
2/5	20	100
1/2	25	125
3/5	30	150
4/5	40	200
1	50	250

UNITS OF WEIGHT

1 g = 0.035 oz
1 Kg = 2.210 lb
1 oz = 28.350 g
1 lb = 453.590 g
1 O = 2 ch = 4 oz
1 ch = 2 oz
1 Se = 8 O
1 P = 4 ch = ¼ Se

UNITS OF VOLUME :

1 l = 1000 ml = 1.76 pt = 0.22 imp gal = 0.264 US gal
1 hl = 1000 l = 0.61 imp ba = 0.84 US fl ba
1 C (Indian) = 1/4 l = 250 ml water = 50 S
1 C (US) = 8 oz = 16 T = 48 tsp = 236.6 ml water
1 C (Imp) = 10 oz = 48 tsp = 16 T = 283.5 ml water
1 S = Indian Standard Spoon = 5 ml water
1 tsp = US teaspoon = 4.9 ml water
1 T = US tablespoon = 14.8 ml water
1 tsp = Imperial teaspoon = 5.9 ml water
1 T = Imperial tablespoon = 17.7 ml water
1 cc = 1 g water
1 ba = 31.5 US gal = 1.19 hl liquid
1 ba = 36 imp gal
1 bu = 4 pk 1 qt = 2 pt (946.4 ml)
1 pk = 8 qt 1 pt = 2 C (US; imp)
1 gal = 4 qt

Glossary of Terms Used in Food Preparation

ADDITIVE is a substance not normally present in the food and which is added to alter the quality of the food. See food additive.

ANTIOXIDANT is a substance capable of chemically protecting other substances from oxidation

ARROWROOT is a starch obtained from tuberous roots of maranta arundinance or curcuma angustifalia.

ASCORBIC ACID is Vitamin C and available in powder and tablet form,

ASEPTIC CANNING is a process in which food is rapidly heated to destroy spoilage organisms, then transferred to sterile tins in such a way that micro-organisms may not reenter during the filling and sealing operations.

BAKE is to cook by dry heat in a closed place, either an oven or oven type appliance.

BARBECUE is to roast slowly, usually basting with a highly seasoned sauce. Barbecues may be baked in a covered pit or roasted on a stationary or rotating skewer.

BASTE is to moisten meat or other foods while cooking by covering surface with such liquids as melted fat, meat drippings, fruit juice or sauce.

BATTER is a mixture of flour and liquid, usually combined with other ingredients to make a mass that is of a soft plastic character; thick enough to stir and thin enough to drop or pour from a spoon.

BEAT is to make a mixture smooth by introducing air with a brisk, regular motion or with a rotary motion as with an egg beater or electric mixer.

BLANCH is to precook by heating in boiling water, juice, syrup or steam in order to (1) inactivate enzymes and shrink some foods for freezing, drying, or tinning, or (2) to aid in removal of skins from nuts, fruits, and some vegetables.

BLAND is mild flavoured smooth or soft textured food.

BLEND is to mix thoroughly two or more ingredients.

BOIL is to cook in water or a liquid consisting mostly of water in which bubbles rise and continually break on the surface. Water boils at sea level at 100°C or 212°F. See table, P. 21.

BRAISE is to cook meat or poultry slowly in a small amount of liquid or steam in a covered utensil.

BREADED is to coat with bread crumbs or to coat with crumbs, dip in slightly beaten egg or milk, and again coat with crumbs. The same procedure can be applied also to besan flour or other food used to coat individual or food mixtures.

BROIL is to cook by direct heat, usually with the flame above the food.

CAKE PAN is used for baking cake. It may be oblong, round or square with straight or slightly flared sides. Some have a removable bottom, some a

tube in the center, some both. The size is designated by dimensions to the nearest ½ cm, of the inside top edge. Some have covers for use in storing or carrying the cake.

CANDIED is a process of cooking in a syrup or in sugar. The sugar or syrup in some instances is kept moist. In other cases fruit, fruit peel, or ginger is cooked in a heavy syrup until translucent, then drained and dried so that the sugar crystallizes.

CANNER is a large covered utensil with side handles, a jar holder, and water capacity such that there is 2½ cm. coverage above the tops of the jars being used for food preservation.

CARAMELIZE is to heat sugar or foods containing sugar with constant stirring until the sugar is melted and dark in colour, though not burned.

CASSEROLE is a utensil usually with a cover in which food may be baked and served. It may have one or two handles.

CHICKEN FRYER is a deep, covered fry pan.

CHOP is to cut into pieces with a knife or other sharp tool.

CHUTNEY is a curry accompaniment which may be raw or cooked, made of fruit or vegetables or a combination of both.

COAGULATION is to change from a fiuid to a thickened jelly, clot or curd.

CODDLE is to cook by pouring boiling water over a food and allowing it to stand until done.

COOKIE SHEET is a flat, rectangular utensil which may be open on one, two or three sides for baking cookies and biscuits.

CREAMED refers to (1) foods cooked in or served with a white sauce, or (2) one or more ingredients worked until soft and creamy, using a spoon, wooden ladle, or electric mixer or blender.

CUP CAKE PAN or MUFFIN PAN is a utensil consisting of a number of suspended individual cups which are sloped slightly on the sides and which are an integral part of the pan for the purpose of baking individual portions of either bread or cake.

CUSTARD CUPS are small, deep, bowl-shaped utensils for oven use in preparing individual servings.

CUT is to divide food materials with a knife or scissors.

CUT IN is to distribute solid fat or cheese into dry ingredients by use of a pastry blender or chopping motion with two knives,

DASH is less than ⅛ Standard Spoon of an ingredient, usually of spice.

DEHYDRATION is a method of food preservation wherein most of the natural water is removed from a food. Foods may be dried in air, super-heated steam, in inert gas, in vacuum, or by direct heat application. Mechanical driers include conveyor belt, drum, kiln. rotary cabinet, tower and tunnel driers. Heat may be supplied by conventional gas and electric methods, dielectric, infra-red and microwave heating methods.

DEHYDRO-FREEZING is a process for food preservation which combines dehydration and freezing. Heated air is used to remove about half the original moisture from the food before freezing. The advantages are that both weight and bulk are reduced in the process.

DICE is to cut into small cubes.

DOUBLE BOILER is a set of two saucepans so made that one pan may be inserted in the other to allow space between pans. Often the set is equipped with only one cover. The capacity is stated for each of the two containers.

DOUBLE FRY PAN OR OMELET PAN consists of two shallow semi-circular or rectangular pans attached by hinges, one acting as a cover for the other.

DOUGH is a mixture of flour and liquid, usually with other ingredients added and thick enough to knead or roll but too stiff to stir or pour.

DREDGE is to sprinkle or coat with flour or other fine substances.

DRY MEASURE is a measuring tool with the capacity indicated by STANDARD cup or portions thereof. Capacity is based on the relation that one cup equals 250 ml water or 50 Standard Spoons equivalent of 5 ml water. The dry measure has the upper edge as the measuring capacity.

DUTCH OVEN is a deep cooking utensil with a close fitting cover. It is sometimes equipped with a trivet. Capacity is stated in liquid measure. The chicken fryer is a similar utensil but is usually of a smaller capacity, though similar diameter.

EGG, BEATEN is the creating of a foam by whipping eggs in any of the following ways : egg whites, beaten stiff, is beating until they stand in peaks that just bend over when the beater is lifted, the surface being moist and glossy.

Egg whites very stiff, is beating until the surface is dry and the peaks stand straight.

Egg yolks, well beaten, is beating until they are thick whole and lemon coloured. Whole eggs, slightly beaten, is beating until the whites and yolks are just blended.

Whole eggs, well beaten, is beating until they are a light frothy colour.

EGG POACHER is an insert holding shallow cups in a covered pan, or a covered pan with such an insert.

ELECTRONIC OVEN is an appliance using microwave energy to heat food. A magnetron tube or generator is used to change electricity into micro-waves.

EMULSIFICATION is a process of reducing large particles of liquids into smaller ones which remain suspended in another liquid. Mechanical emulsification is the process used to homogenize ice cream mixtures. Chemical emulsion takes place with oil in mayonnaise with the use of an acid and lecithin from the egg yolk. In body processes, bile salts emulsify fats during digestion.

FOLD is to combine by (1) using two motions, one which cuts vertically through the mixture and the other which turns over by sliding the implement across the bottom and up the side of the mixing bowl or container, and (2) to lap yeast or other dough over on to itself.

FOOD ADDITIVE is a substance added to food in order to (1) emulsify (lecithin, propylene glycol), (2) flavour (spices, essences), (3) improve nutrient content (vitamins, minerals), (4) leaven, (prevent caking clarify, harden, soften, etc.), (5) oxidize and/or bleach (potassium bromate), (6) preserve (antimycotic agents, antioxidants), (7) stabilize and thicken (gelatin, agar, pectin), and (8) sweeten (saccharin, sodium or calcium cyclamate).

FOOD STANDARDS are specifications for certain food standards including (1) enrichment to guarantee uniformity of product, (2) fill of container, (3) identity with food description as to composition, and (4) quality with minimum specifications for such factors as colour freedom from defects, and tenderness.

Many of these standards are specified by the Indian Standards Institution and regulated by them.

FREEZE-DRYING is a process of food preservation wherein food is dried by sublimation. Fresh food is frozen to remove moisture and then dried under high vacuum conditions so that approximately 2 percent of the original water remains. The freeze dried product is light in weight and retains its original shape when rehydrated; can be stored without refrigeration.

FREEZING is a method of preserving food by chilling it very rapidly at a low temperature (usually –24°C (–10°F) or below) and maintaining a temperature below –18°C (6°F). Freezing may be accomplished by (1) indirect contact with a refrigerant, (2) a blast of cold air, or (3) by direct immersion in a refrigerating medium.

FRENCH FRYER is an uncovered cooking utensil with a perforated, meshed or sieve-like insert basket with one handle.

FRICASSE is to cook by braising, usually applied to meat cut into pieces and cooked slowly in a covered utensil with a small amount of liquid.

FRUIT JUICE is the natural juice pressed out of a fruit, remaining practically unaltered in its composition during preparation and preservation.

FRUIT JUICE BEVERAGE is a fruit juice which is considerably altered in composition and may be diluted before being served. It may be concentrated, fermented and or mixed with other fruit juices with or without preservatives being added.

FRUIT JUICE CORDIAL is sweetened fruit juice from which all the pulp and other suspended matter has been removed.

FRUIT JUICE SQUASH is strained juice containing a small quantity of fruit pulp and has sugar added for sweetening.

FRY is to cook in fat, especially (1) pan-fry, saute or cooking in a small amount of fat, and (2) cooking in a deep layer of fat (deep-fat frying).

FRY PAN OR SKILLET is a shallow pan with a handle, covered or uncovered. The size is stated by the top diameter.

GEL is to thicken into a solid mass with the use of gelatin or pectin.

GLACE is to coat with a thin sugar syrup cooked to the crack stage; or it may refer to an uncooked icing sugar mixture for certain types of bread or such products as doughnuts.

GRIDDLE is a very shallow, uncovered, smooth and heavy utensil for the purpose of frying in little or no fat. The size is stated by the outside dimension.

GRILL is to cook by direct heat or the term may refer to a utensil or appliance used for such cooking.

GRIND is to reduce to particles by cutting or crushing.

HAY BOX is an insulated box where hay is used to surround food which has been partially cooked so as to allow cooking to proceed with the heat already produced by the fire and to retain the food hot until required.

HOMOGENIZE is to break into regular sized small particles. In homogenized shortening, air has been distributed evenly throughout the fat. Homogenized milk has been processed so that the fat becomes small globules that will not rise to the top as cream.

HYDROGENATION is a process in which hydrogen is combined with an unsaturated compound to form a solid or semi-solid. Oil may be so converted to a solid.

ICING (FROSING) may be cooked or uncooked. When cooked it is made by boiling sugar and water or milk to the designated temperature or consistency, then either beating or heating and adding other ingredients before spreading.

LOAF PAN is a deep, narrow, rectangular utensil with slightly flared sides; designed for oven use.

LUKEWARM is approximately 35°C (95°F) and may be referred to as tepid. Lukewarm foods sprinkled on the palm side of the wrist will not feel warm.

MALT is sprouts of moist grain which have been heated, dried, and ground into a flour – like powder.

MARINATE is to let food stand in a liquid before either further processing or eating. Marinades may be an oil-acid mixture with or without spices.

MEASURING SPOONS are a group of spoons of the following measures: 3 Standard Spoons, I Standard Spoon, 1/2 Standard Spoon, and1/4 Standard Spoon, or any combinations of these measures. Capacity of the Standard Spoon is determined by the amount of food it contains after it is leveled with a straight edge of a knife or spatula. The Standard Spoon equals 5 millilitres of water.

MICROWAVE is about 5" or 12 cm. as an electromagnetic wave of high frequency energy produced by oscillation of an electric charge. Microwaves penetrate food to a depth of 2 1/2 to 3 ins or 4 to 7 cm. Microwave energy is converted into heat when it is absorbed by a food, time required for cooking dependent on the composition, weight, shape, and size of the food; also the initial temperature, degree of doneness desired, and the type of utensil used to hold the food.

MINCE is to cut or chop into very small pieces.

MIX is to combine ingredients in any way that effects a distribution.

MONOSODIUM GLUTAMATE is a chemical added to food to enhance flavour. Its effect on flavour is dependent on the kinds and amounts of other flavours in the food.

MUFFIN PAN or TIN – See Cupcake Pan.

PAN-BROIL is to cook uncovered on a hot surface, usually in a fry pan. Fat is poured off as accumulated.

PAN-FRY (Fry, Saute) is to cook in a small amount of fat.

PARBOIL is to boil until partially cooked. Sometimes the liquid used is destroyed and fresh liquid used for the regular cooking ; sometimes another method is used for cooking.

PARCH is to brown by means of dry heat, usually, grains and nuts.

PARE (PEEL) is to cut off the outside covering.

PASTEURIZE is to preserve food by heating and holding at a specific temperature for a specified length of time which is sufficient to destroy certain micro-organisms and arrest fermentation. Temperatures vary according to the foods but usually are within the range of 60°C (140°F) and 82°C (180°F).

PEEL (PARE) is to cut off the outside covering.

PICKLES are fruits or vegetables which are preserved in vinegar, lime or lemon juice, and salt with spices and sometimes oil added. Pickles may be fermented or unfermented and either sweet or sour.

PIE PANS OR PLATES are round, open utensils with flared sides, especially designed for baking pies. The size refers to the diameter which frequently is 11 cm, 19cm, or 21 cm, and measured at the upper edge of the pan.

PIZZA PAN is usually round with a shallow edge and may vary in size from very small to large, i. e. 12 cm to 30 cm, and used for baking a product with dough (baking-powder, pastry, or yeast) over which a thick tomato puree seasoned with oregano, salt, and pepper and with any or all of the following ingredients: cheese, meat, mushroom, capsicum, etc.

POACH is to cook in a hot liquid in a way that the shape of food is retained.

POT ROAST is a term applied to cooking a large cut of meat by braising, i.e. slowly in a small amount of liquid.

PRESSURE COOKER is an airtight container for cooking food under steam pressure at a high temperature. It is equipped with a gauge for measuring and indicating the pressure.

RADIATION is the combined processes of radiant energy being emitted, transmitted, and absorbed. To preserve food, small doses of ionizing radiation are applied to foods in order to prolong the shelf life of perishable foods, such as fresh sea food. When 2 to 5 million rads of radiation is applied, microbial growth is destroyed and the food becomes sterile. Alpha and beta particles and gamma rays are the radiations used in food preservation. Quality of the finished product and economic factors have limited commercial application of food preservation by radiation.

RECONSTITUTE is to restore concentrated foods to their normal state, usually by adding water.

REHYDRATION is to soak, cook or use other procedures to restore water lost to food during the dehydration process.

RENDER is to free fat from connective tissue with the use of low heat.

ROAST is to cook uncovered in hot air. It may be done in an oven, in ashes under coals, or on heated metal or stone. (banana, corn, meat etc.)

ROASTER is a covered pan, with or without a rack especially designed for cooking meats and poultry. The size is measured by length, width and height of the pan and cover, including handles.

ROTISSERIE is an appliance designed to roast meat or poultry by dry heat on a turning spit.

SAUCEPAN is a covered or uncovered cooking utensil with one handle. Capacity is stated in liquid measurement.

SAUTE is to brown or cook in a small amount of fat.

SCALD is to (1) dip foods into boiling water, (see blanch), or (2) to heat milk to just below the boiling point.

SCALLOP is to bake food, usually cut into slices, with a sauce or other liquid. The sauce and food may be mixed together or arranged in layers and there may or may not be a topping of crumbs or other mixture.

SEAR is to brown the surface of meat by a short application of intense heat.

SEASON is to add salt, pepper, sugar, spices, or other ingredients to provide flavour for a particular food or recipe.

SHERBET is a frozen dessert composed of fruit juice or pulp, sugar and either water or milk. Egg white or gelatin may be added to improve the consistency.

SHERBET is sugar syrup flavoured with artificial essences of fruits or herbs used to make beverages—a synthetic beverage.

SKEWER is to string on wooden or metal rods for cooking.

SIMMER is to cook in a liquid just below the boiling point at temperatures varying from 85°C (185°F) to 99°C (210°F) depending on the ingredients and liquid. Bubbles should form slowly and collapse below the surface.

SOLUTION is a uniform liquid blend containing a solute (such as sugar) and a solvent (liquid).

SCORBIC ACID is an antimycotic agent used in foods such as cheese to retard mould growth.

SPECIFIC GRAVITY is the weight of a volume of substance in relation to the weight of an equal volume of water, e.g. 1 cc water weighs 1 gram at 4°C (104°F).

STEAM is to cook in steam with or without pressure. (Iddli, appam, simulated poached egg: string hopper, etc.)

STEAM COOKER is a covered saucepan or pot having one or more perforated insert pans equipped with a handle or handles. Inserts such as those for iddli may pe purchased either with or without the saucepan or pressure cooker.

STEEP is to allow a substance to stand in liquid below the boiling point to extract colour, flavour, or other qualities.

STERILIZE is to destroy microorganisms, usually in the home by the use of high temperature with steam, hot air, or boiling liquid.

STEW is to simmer in a small quantity of liquid in a covered or uncovered utensil.

STEWPAN or POT is a covered or uncovered cooking utensil equipped with two side handles (or the common dekchi without handles). Capacity is stated in liquid measurement.

STIR is to mix food materials with a circular motion for the purpose of a uniform consistency or blend.

TEXTURE refers to the properties of food such as roughness, graininess, smoothness, softness, etc. that are either visible or felt by touch.

TOAST is to brown by means of dry heat with or without fat.

TOMATO COCKTAIL is tomato juice to which salt, vinegar, worcestershire sauce, lemon or lime juice, and spices are added in different proportions according to taste.

TOMATO KETCHUP is made by concentrating tomato solids, without seed or skin, to not less than 12 percent with no more than 28 percent total solids which include garlic, onion, salt, spices, sugar and vinegar.

TOMATO PASTE is a concentrated tomato pulp without seeds and skin containing not less than 25 percent of solids. Concentrated tomato paste contains 33 percent or more of tomato solids. Basil leaf and salt may be added. Part of the acid may be neutralized with carbonate or sodium bicarbonate. The percent of solids is determined by an able refractometer.

SOYA SAUCE is a brown liquid composed of cooked and fermented soyabeans and wheat and molasses in a 15–20 percent brine solution.

UTENSILS FOR COOKING are highly varied. Most utensils are measured from the top inside for length, width, or diameter.

VISCOSITY is the property of fluids that determine whether or not they flow readily. A pure liquid at a given temperature and pressure has a definite viscosity which usually increases with a decrease in temperature. As an example, sugar syrup thickens as the temperature decreases ; so does a sago preparation.

WARM is to raise the temperature to between 40°C (105°F) and 46°C (115°F) for food, depending on the food and combination of ingredients.

WHIP is to beat rapidly to incorporate air and produce expansion, (cream, egg, gelatin).

Recipe Construction

A recipe has two major parts. First is the list of ingredients and second is the method of preparation. Each recipe is written so as to be accurate, have all necessary details and be clearly understandable.

RULES FOR WRITING OR EDITING RECIPES

Ingredients. List all ingredients with measurements, in the order used.

List ingredients in the easiest measuring units, with standard measurements such as 1/5, 2/5, 1/2, 3/5 cup; 3, 1, ½, ¼, Spoon.

Use weights when helpful, such as for uncooked meat, tinned food and cheese.

Specify the types of products needed, as maida, rice flour, or atta.

Give exact names for products rather than brand names.

METHOD

Use short simple sentences that can be followed easily by the inexperienced as well as the experienced homemaker.

Describe in word pictures like "mixture thickens as it cooks," "beat after mixture becomes syrupy."

Specify in simple terms the best procedure to use for steps of recipes.

Order the steps of a recipe to avoid use of extra bowls, cups, spoons, etc.

Specify size of pans or bowls needed.

Try to give both general and specific tests or temperatures; i. e.: cook until 135°C or a small amount of syrup becomes firm but not brittle in cold water. Bake at 175°C (350°F, moderate oven). Fry (Puri) until brown and puffed out so that the center is hollow.

Give the number and size of servings to expect or the total measure, i. e. makes four 1 cup servings or one litre.

ACCURACY

Reread to see if the recipe says exactly what is meant. Is it clear, simple, complete, and, as brief as possible?

Recheck the order of ingredients for any omissions in temperatures, times, yields, etc.

With every typing or printing of the recipe, check proofs against original correct copy. Read again.

RECIPE FORMS

Recipes may be written in different ways with advantages and disadvantages for each form and depending at times on the particular recipe.

STANDARD FORM. This form gives all ingredients first. The ingredients are listed with needed information about quantity and description.

Following the ingredients, method of procedure is given in the order of mixing or doing.

This form is especially good when many ingredients or many steps are involved.

EXAMPLE OF STANDARD FORM

Fish Curry — 4 servings of ½C

3	S	chopped onion
6	S	shortening or oil from tuna fish
1	S	chillie powder
9	S	curry powder
½	S	turmeric powder
6		curry leaves
1	C	water
½		coconut, grated
1		350 g tin of tuna fish or equivalent

1. Fry the onions lightly in the shortening.
2. Add the spices and curry leaves; fry one minute.
3. Add water and simmer for five minutes.
4. Add coconut and fish and cook uncovered for 10 minutes.

ACTION FORM. This recipe form has the action procedure written along with the listing of ingredients. This recipe style is easy to follow so far as steps is concerned; it is difficult to see readily all needed ingredients and it may take more space to write.

EXAMPLE OF ACTION FORM

Vegetable Pillau 4 servings of $1\frac{1}{4}$C

Heat 9 S shortening in a pan.

Add and fry lightly :

1 medium onion cut into slices.

Add 1 C rice and fry three minutes, stirring gently.

Add and cook 20 minutes on a slow fire :

1 C chopped raw vegetables (beans and carrots)
$\frac{1}{4}$ S turmeric powder
1 S salt
6 whole cloves
3 cardamon
1 S chilli powder
2 cinnamon sticks (1 cm x 4 cm each)
3 C boiling water

Cook for 20 minutes on a slow fire.

Serve with curry. Garnish, if desired, with nuts, fried onion, slices of boiled egg, chopped coriander or parsley leaves.

NARRATIVE FORM. The narrative recipe form includes the amounts of ingredients with the method. It is useful where directions are complex and ingredients are few. The advantage is that a small space is used. This is the hardest recipe form to follow.

EXAMPLE OF NARRATIVE FORM

Banana Special 2 servings, $\frac{3}{5}$C

Beat one sliced, ripe banana with 1 Cup of cold milk and 1/4 Spoon of vanilla in a bowl or blender until smooth. Pour into glasses and serve. (A pinch of ground nutmeg 2 S of malt, 2 S cocoa and 2 S sugar, rose or other flavours may be used instead of vanilla).

DESCRIPTIVE FORM. In this recipe form, each ingredient is listed and followed by specific details. For example: brown sugar, packed ; carrots, diced ; eggs, well beaten.

The amounts of ingredients are given in a separate column. Each step in the procedure is a separate paragraph to the right of the amount. This recipe form enables the cook to readily see what ingredients are needed and the instructions of each step.

EXAMPLE OF DESCRIPTIVE FORM

Khesari 30 pieces 3 cm x 3 cm

ghee	1/5 C	Melt the ghee in a saucepan.
raisins, chopped	3 S	
cashewnuts, chopped	3 S	Fry the cashewnuts and raisins.
suji, fine	4/5 C	
sugar	$1\frac{1}{2}$ C	Add suji, sugar, and
salt	pinch	salt, mix well.
water	4/5 C	Slowly add water, stirring constantly until the mixture is thick.
saffron *, soaked in	1/4 S	
water	2 S	Add saffron-water.
cardamon **, crushed	2 S	Add cardamon and cook until mixture leaves side of pan.

Spread in a shallow, greased dish to 2 cm thickness.

The top may be decorated with nuts. raisins or silver leaf.

When cool, cut into pieces and serve.

* saffron can be omitted and yellow colour added.

** cardamon can be omitted when the the mild flavour of saffron is wanted.

Standard Measures for Other Recipes

Using the rules for writing or editing recipes, favourite recipes can be altered to use the newly established Standard Cup and Standard Spoon set.

FOR PRACTICAL APPLICATION in day to day use, the following method has been found useful with small quantity recipes:

For the 8 oz. cup, measure 1 S. Cup and scoop out 2½ Standard Spoons per each cup of ingredient in the recipe.

If the recipe calls for a 10 oz. cup, add to each Standard Cup 6 3/4 Standard Spoons of the same ingredient.

For spoon measurement, convert all spoon measurements to teaspoons and use the Standard Spoon as equivalent to the teaspoon.

The above modifications are suggested to ensure the same resulting product both as to quantity and quality.

FOR RESEARCH PURPOSES AND QUANTITY RECIPES

The Standard Cup is 5. 7 percent larger than the 8 oz. cup and 12 percent smaller than the 10 oz. cup. To convert recipes that do not involve eggs, using the Standard Cup and Standard Spoon, convert Tablespoon measurements to teaspoons and do either of the following:

For the 8 oz. cup recipes—either increase the teaspoon quantity by 0.1 percent per Standard Spoon or decrease the Standard Cup measurement by 0.1 percent.

For the 10 oz. cup recipes—either decrease the teaspoon quantities by 0. 9 percent or increase the cup quantities by 0. 9 percent.

i. e. for the 8 oz. cup, if the recipe calls for 5 teaspoons put 5½ Standard Spoons of that ingredient per whatever number of cups of ingredients by Standard Cup, or

for 5 teaspoons use 5 S. Spoons and if there are 2½ cups of another ingredient, then use 2¼ S. Cups of the ingredient.

Where eggs are involved in converting recipes, this will need consideration. For the 8 oz. cup recipes, the egg will be 8 ml. short when converting to the 250 ml. Standard Cup. Until research is carried out to give a conversion formula, the safest method of converting the recipe is to use the quantity of eggs listed in the recipe and reduce the cup and spoon quantities by 5. 7 percent.

For the 10 oz. cup recipes, keeping the eggs the same and increasing the cup and spoon quantities by 12 percent will give both the correct proportions and the same quantity of product.

For research work, dietetics, and quantity recipes the following table may be useful.

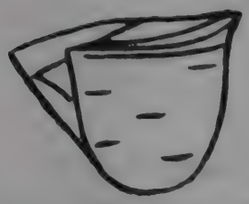
S. Cup	No.	S. Spoon	ml	Percent	Content
1/5	10		50	20	
		12.5			25
		15			30
		17.5			35
2/5	20		100	40	
		22.5			45
1/2	25		125	50	
		27.5			55
3/5	30		150	60	
		32.5			65
		35			70
		37.5			75
4/5	40		200	80	
		42.5			85
		45			90
		47.5			95
1	50		250	100	

Equivalents of Standard Cup with other measures :

Standard cup volume =

1.056 of the U. S. standard cup which is 236.55 ml or 8 oz.

0.88 of the U. K. standard cup which is 283.5 ml or 10 oz.



Methods of Measuring Ingredients

FATS AND OILS

FATS-SOLID. A 1/2 kg packet of butter is equivalent to about 2 cups.

To measure one standard cup of fat, press the fat firmly into the measure until it is full. Level with the straight edge of a knife.

TO MEASURE DIVISIONS OF A CUP:

Measure in standard spoons.
Use individual cups measuring 1/5, or 1/2 cup

or

Use the water displacement method, by pouring cold water into a cup up to the measure which will equal 1 cup when the desired amount of fat is added. Add enough fat to the water to bring the level up to one cup. Drain off the water. This method is satisfactory if water that clings to the fat does no affect adversely the product.

OILS AND MELTED FATS. are measured by pouring into a translucent measuring cup to the desired mark.

FLOURS AND MEALS. Maida: Sift maida once, spoon it lightly into a standard cup until it comes above the top of the measure. Without shaking the cup, level the maida by moving the blunt side of a straight edged knife along the top edge of the cup, or to the line in a liquid measuring cup.

Whole-grain flours and Meals; (atta, rava/sooji, ragi), Stir lightly with a spoon, then without sifting, measure as for maida.

MILKS. Fluid Milks: Measure by pouring milk into the cup to the measure mark.

Dry Milks. Spoon lightly into standard cup, and without shaking, level with the straight edge of a knife, or fill to the line in a liquid measuring cup.

POWDERED FOODS IN SMALL QUANTITIES.

Stir the powder in its container enough to lighten the product and break up any lumps. Dip dry spoon into the powder and level off the excess with the straight edge of a knife.

To measure divisions of a standard spoon, use individual measuring 1/2 or 1/4 standard spoon, or measure a level spoon and subdivide it lengthwise and crosswise with a knife. Push the unwanted 1/4, 1/2 or 3/4 of powder back into the container.

SUGARS AND SYRUPS. Syrups: Pour syrups into the spoon or cup to the measure mark. Sugars, Brown sugar: Roll or sift out any lumps, then pack brown sugar firmly into the cup or spoon. Level with the straight edge of a knife.

White Sugar. Measure by putting into the cup or spoon to just above the full mark and level by means of the blunt side of a straight edged knife along the top edge, or to the line in a liquid measuring cup.

Substitution of Ingredients

Ingredients	Amount	Substitutes
baking powder	1 standard spoon	1/4 S baking soda plus 1/2 S Cream of tartar
		1/4 S baking soda plus 2 S vinegar and milk to make 1/2 C.*
		1/4 S baking soda plus 1/2 C buttermilk.
		1/4 S baking soda plus 2/5 C molasses. **
		* decrease liquid called for in recipe by 1/2 cup.
		** decrease liquid by 1/2 cup and sugar by 2/5 cup.
bread crumbs, dry	2/5 C	4/5 C soft bread crumbs or 1 slice bread.
butter	1 C	4/5 C hydrogenated fat plus 1/2 S salt.
		4/5 C cooking oil plus 1/2 S salt.
		4/5 C lard plus 1/2 S salt.
		4/5 C bacon or chicken fat.
		1 C margarine.
catsup or chilli sauce	1 C	1 C tomato sauce plus 1/2 C sugar and 3 S vinegar (use in cooking with or without adding chilli powder).
chocolate, semi sweet	1 oz (28.35 gm)	1 oz unsweetened chocolate plus 2 S sugar.
chocolate, unsweetened	1 oz	9 S Cocoa plus 3 S fat.
chocolate, unsweetened	10 gm	3 S Cocoa plus 1 S fat.
coconut	3 S grated dry	4 1/2 S fresh, grated
coconut milk	1 C	1 C milk, buffalow, cow or toned
corn syrup	1 C	1 C sugar + 1/5 C water
		1 C honey
cracker crumbs	4/5 C	1 C bread crumbs, dry
cream, heavy 36–40% fat	1 C	4/5 C milk + 2/5 C butter
cream, light 18–20% fat	1 C	4/5 C milk + 1/5 C butter
cream, sour	1 C	4/5 C sour milk + 1/5 C butter
egg, duck	1 whole	1 large hen egg
egg, hen	1 whole	2 yolks + 3 S water for baking
		2 yolks for puddings
flours		
maida (all purpose)	1 C sifted	1/5 C atta + 4/5 C maida
		4/5 C atta + 1/5 C maida
		4/5 C maize flour + 1/5 C maida
		1 ½ C bread crumbs
		1/2 C oats + 1/2 C maida
		4/5 C rice flour (as part of flour in baking)
		3/5 C rye flour + 2/5 C maida
		1/5 C soya flour + 4/5 C maida

Ingredients flours continued	Amount	Substitutes
maida for thickening	3 S	1 ½ S arrowroot, corn, or rice flour 3-4 S sago, granular 2 S sago, quick cooking 1 whole egg 2 egg whites 2 egg yolks 6 S granular cereal
rice flour	4/5 C	1 C maida (in baking cake)
garlic	1 clove, small	1/8 S garlic powder
ginger	1/8 S powder	3 S candied ginger rinsed in water, finely cut.
herbs, fresh	3 S finely cut	1 S dried herb
honey	1 C	1 1/5 C sugar plus 1/5 C water
macaroni	4 C cooked	2 C uncooked 2 C uncooked spaghetti or noodles: 1 C uncooked rice.
milk, buttermilk or sour	1 C	1 C sweet milk–3 S, plus 3 S lemon, juice or vinegar, or tamarind juice. 1 C sweet milk plus 1 3/4 S cream of tartar. 1 C yogurt or curd.
milk, condensed	1 tin (305 g)	2½ C milk and ½ C sugar
milk, evaporated	1/2 C + 1/2 C water 1/2 C water	1 C whole milk
milk, skim	1 C	1/3 C skim milk powder and water to make 250 ml or 1 cup.
milk, whole	1 ltr.	4 C
	1 C	1/3 C whole milk powder and water to make 250 ml or 1 C
molasses	1 C	1 C honey 1 C treacle
mushrooms	1/2 kg fresh	1/4 kg or 250 gms tinned. 100 gms dried.
mustard, dry	1 S	3 S prepared mustard
rice (to thicken)	6–9 S per 1 C liquid	9 S sago for 1 C or 3–5 S cornflour
rice	3–4 cups cooked	1 Cup regular, uncooked or 1 C cracked wheat.
sago (to thicken)	3 S granular	6 S pearl sago (tapioca)
	6–9 S (pearl)	3–5 S cornflour
	6–9 S (pearl)	6–10 S maida
	1 C liquid	6 S–10 S rice or 1/5 C pearl sago or 3–5 S cornflour
shrimp	1 C cleaned, cooked	1/2 kg raw in shell 125 gm. tinned shrimp
vinegar	equal	tamarind - lime
yeast, active dry	3 S	1 packet (¼ oz) active dry, 1 cake compressed yeast

Measurement Equivalents

Weights

grams	ounces
1	0.035
2	0.07
3	0.11
4	0.14
5	0.18
6	0.21
7	0.25
8	0.28
9	0.32
10	0.35

kg	pounds
1	2.205
2	4.41
3	6.61
4	8.82
5	11.02
6	13.23
7	15.43
8	17.64
9	19.84
10	22.05

oz	pounds	grams
1	0.06	28.35
2	0.12	56.70
3	0.19	85.05
4	0.25	113.40
5	0.31	141.75
6	0.38	170.10
7	0.44	198.45
8	0.50	226.80
9	0.56	255.15
10	0.62	283.50

1b	kilogram
1	0.454
2	0.91
3	1.36
4	1.81
5	2.27
6	2.72
7	3.18
8	3.63
9	4.08
10	4.54

Metric, Imperial, and United States Units of Liquid Measure

ml.	ounces
1	0.034
2	0.07
3	0.10
4	0.14
5	0.17
6	0.20
7	0.24
8	0.27
9	0.30
10	0.34

oz	millilitre
1	29.573
2	59.15
3	88.72
4	118.30
5	147.87
6	177.44
7	207.02
8	236.59
9	266.16
10	295.73

litre	gallons imp	gallons US
1	0.219	0.264
2	0.438	0.528
3	0.660	0.792
4	0.880	1.056
5	1.100	1.321
6	1.320	1.584
7	1.540	1.848
8	1.760	2.112
9	1.980	2.376
10	2.200	2.642

gallons imp	gallons US	litre
1	1.200	4.546
2	2.401	9.092
3	3.601	13.638
4	4.802	18.184
5	6.002	22.730
6	7.202	27.276
7	8.403	31.822
8	9.604	36.368
9	10.805	40.914
10	12.004	45.460

Approximate Boiling Temperatures of Water

Altitude	Boiling Point of Water	
Sea level	100.0°C	212.0°F
1000m (3250ft)	94.5	202.0
2000m (6500ft)	94.0	201.0
3000m (9750ft)	90.5	195.0
5000m (16250ft)	83.5	182.0
Sea level	100.0°C	212.0°F
2000ft (615.38m)	98.4	208.4
5000ft (1538.45m)	95.0	203.0
7500ft (2307·67m)	92.4	198.4
10000ft (3076.90m)	90.0	194.0
30000ft (9230.70m)	70.0	158.0

Steam Pressures and Temperatures At Various Altitudes

Temperature		Steam Pressure at altitude of : Sea level		1231m 4000ft		1846m 6000ft		2308m 7500ft	
°C	°F	1b	kg	1b	kg	1b	kg	1b	kg
109	228	5	2.2	7	3.2	8	3.6	9	4.1
115	240	10	4.5	12	5.4	13	5.9	14	6.3
121	250	15	6.7	17	7.7	18	8.2	19	8.6
126	259	20	9.0	22	10	23	10	24	11

N. B. for pressure cooker adjustment

Baking Time and Temperature

PRODUCT	OVEN TEMPERATURE °C	OVEN TEMPERATURE °F	LENGTH OF TIME
Breads			
Biscuit, baking powder	220	425	10–15 min
Cornbread (Maize)	205	400	30–40 min
Curry Puff (Vegetable)	190	375	20–30 min
Doughnuts	220	425	10 min
Muffins, scones	205	400	20–25 min
Nan	225–232	425–450	10–15 min
Popover	190	375	1 hr.
Quick Loaf Bread	177–190	350–375	45–1¼ hr.
Samosa (Vegetable)	190	375	20 min
Yeast Bread	205	400	30–40 min
Yeast rolls, plain	205	400	15–25 min
Yeast rolls, sweet	190	375	20–30 min
Biscuit, sweet (cookies)			
Cream puff	190	375	1 hr.
dropped from spoon	177–190	350–375	7–15 min
rolled, sliced	190	375	8–12 min
Cake with fat			
individual, cup	177–190	350–375	15–25 min
Layer	177–190	350–375	20–35 min
Loaf	177	350	45–60 min
Sheet	177–190	350–375	30–45 min
Cakes without fat			
Angel food	177	350	40–50 min
Sponge	190	375	30–45 min
Egg and Meat dishes			
Custard, souffle	177	350	30–60 min
Kabab	177	350	25–40 min
Meat loaf	150	300	1–1½ hr.
Meat patty, pie	205	400	25–30 min
Puffs, curry	190	375	20–35 min
Samosa	190	375	15–25 min
Milk and Cheese dishes			
Macaroni and cheese	170	350	25–30 min
rice pudding, cooked rice	170	350	25–35 min
rice pudding, raw rice	165	325	2– 3 hr.
Scalloped potatoes	170	350	1 hr.
Pastry (for curry puffs, samosa, see Breads and Egg and meat dishes).			
Pie	°C	°F	
One crust custard, unbaked shell	205	400	30–40 min
Meringue cooked filling,	176	350	12–15 min
Pre-baked shell	220	425	4– 5 min
Shell only	232	450	10–15 min
Two crust pie, cooked filling	232	450	30–45 min
Two crust pie, uncooked	205	400	45–55 min

NOTE: 1. When using a glass casserole or pie container, reduce the above temperatures by 25° F or 5° C.
2. When baking at Altitudes above sea level:

Product	1231 - 1538 meter (4000 - 5000 ft.)		1846 - 2154 meter (6000 - 7000 ft.)	
Cake / Cookies	increase 30° F per each 3½ mtr.		increase 25 °F	
Baking powder biscuit	no change		450 °F	
Muffins / Scones	210 °C	410 °F	220 °C	425 °F

OVEN TEMPERATURES

Temperature		Term	In an oven Pre-heated for 15 minutes The colour of maida after 5 minutes is
degrees C	degrees F		
120 – 135	250 – 275	very slow oven	dark cream colour
150 – 165	300 – 325	slow oven	Staw colour
177 – 190	350 – 375	moderate oven	light brown
205 – 220	400 – 425	hot even	golden brown
232 – 245	450 – 475	very hot oven	dark brown
260 – 274	500 – 525	Extremely hot oven	

NOTE :—Over temperatures may vary from true temperatures.

TEMPERATURES FOR DEEP - FAT FRYING

Type of product	Temperature of Fat	
	degrees C	degrees F
chicken	177	350
bananas, doughnuts, fish, muraku, scallops, vadai,	177 – 190	350 – 375
bonda, brinjal, curry puff, cutlets, onion, samosa	190 – 195	375 – 385
potatoes (french fry or finger)	195 – 201	385 – 395

At high altitude fry foods at 10 – 15° C or 25 – 35° F lower than given above due to the lower boiling point of water in foods, i. e. if 177° C then fry at 163 – 168° C; 375 F - 385°F then fry at 350 – 360°F.

ALTITUDE COOKERY

Cake Baking Cake recipes for use at sea level need not be altered unless they are used at altitudes of (3000 feet) 923 metres or higher. Adjustments usually involve a decrease in leavening or sugar (or both) and an increase in liquid. Only repeated experiments with each recipe will produce the best balance of proportions due to difference in richness and balance of ingredients. The table below is a guide :-

Adjustment		923 mts	1538 mts	2154 mts
Reduce baking powder	For each S decrease	1/8 S	1/8 – 1/4 S	1/4 S
Reduce soda	For each S decrease	–	0 – 1/8 S	1/8 – 1/4 S
Reduce sugar	For each cup decrease	0 – 3 S	0 – . 6 S	3 – 9 S
Increase liquid	For each cup, add	3 – 6 S	6 – 12 S	9 – 12 S
Increase egg	For each egg in angel food or sponge cake	–	0 – 1/2	1/2 – 1

When making very rich cakes at high altitude shortening may be reduced by 1 – 6 S per cup.

Biscuits (Cookies), brownies, quick breads and doughnuts usually need no alterations for high altitude cookery.

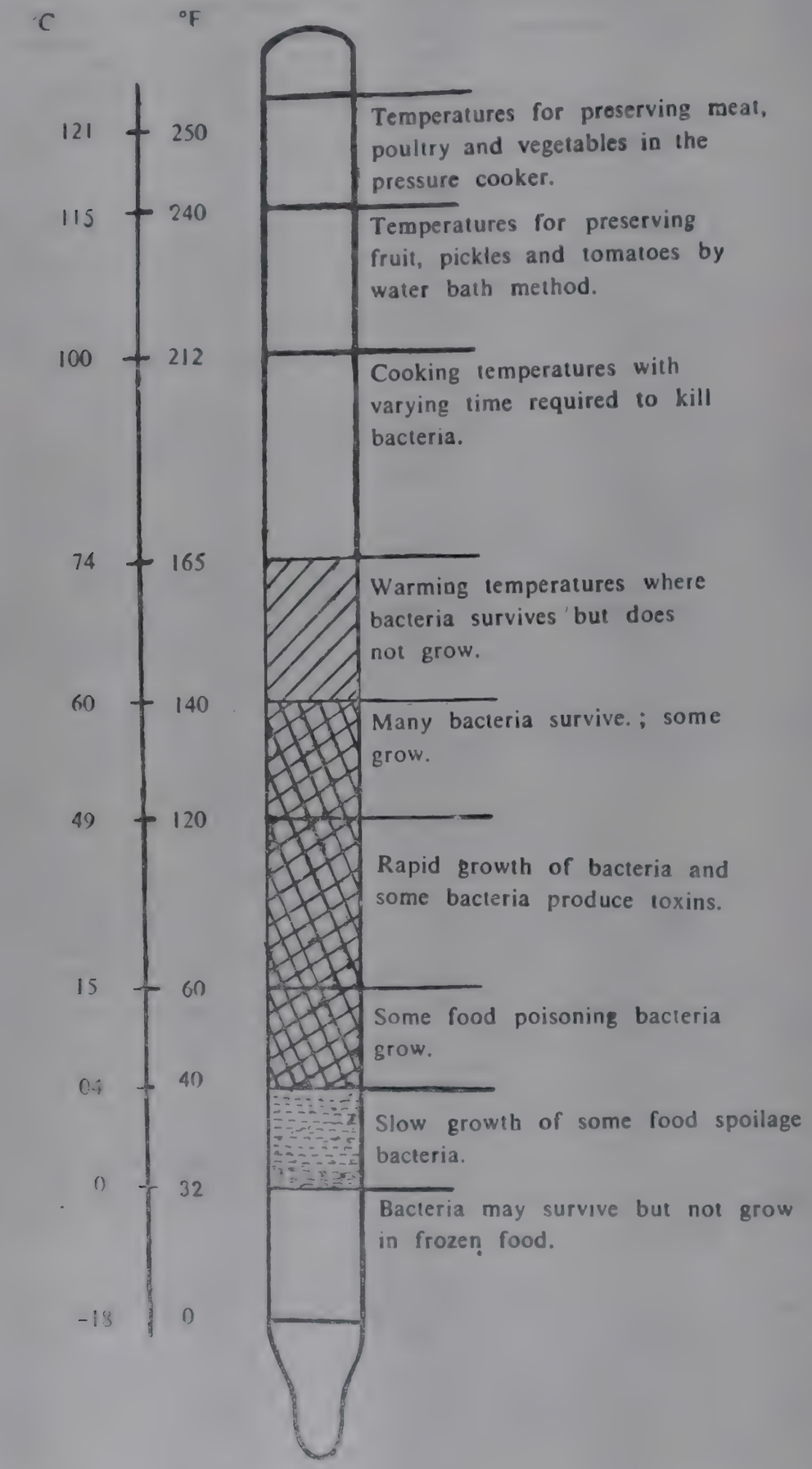
When corn flour is used for thickening, maximum gelatinization of starch can be obtained by cooking over direct heat rather than using a double boiler at high altitudes.

BASIC PROPORTIONS OF RECIPES

The following table is a guide for proportions of ingredients to one another in a given recipe.

Product	Flour or Maida	Liquid	Fat	Eggs	Salt	Sugar	Baking Powder	Other Ingredients
BEVERAGES								
Cocoa		1 C Milk			few grains	3S		3 S Cocoa or 15 g chocolate
Coffee		4/5 C water						6 S coffee
Instant Coffee		4/5 C water						1-1¼ S
Tea		4/5 C						½-1 S tea
BREADS								
Biscuit (baking powder)	1 C maida	1/5-½ C milk	7S		½S		2S	
Muffin (Scone)	1 C maida	½C milk	6S	1/2	½S	3S	2S	
Pancake	1 C maida	1C milk	3S	1/2	½S	0-3S	3S	
Nan	2C maida	4/5C curd 4/5C water	1½S	1 white	½S	3/4S		Optional : ½S anise seed ½S onionseed
Parata	1 1/5C atta	3/5C water	0-3S		½S			
Dhosai	1C rice	water to cover	to fry		¾S		1/8S	1/5C black gram dhal, raw coriander 1" ginger 1 small onion 1 green chillie
Idli	½C rice	water to cover			½S		pinch if batter is not fermented	1/5C black gram dhal
Vadai	1C black gram dhal 1C rava	½C curd	to fry			½S		1-2 green chillie few raw coriander leaves. ½S cummin ½C onion 1" ginger 1 stem curry
Muraku	1C Bengal gram 5C rice	To moisten to steam	to fry		½S			¼S tumeric ¼S chillie powder 1S cummin
Muraku	1C Bengal gram 5C maida	to moisten to steam	to fry		½S			¼S tumeric ¼S chillie 1S cummin
Karanchi	2/5C maida 1/5C atta	4½S water	1/5C ghee			1/5C powdered		1/5C coconut 1/2S poppy seed 1/4S nutmeg

TEMPERATURE OF FOOD FOR BACTERIAL CONTROL



°C—°F Temperature Conversion Chart

The numbers at the side and top indicate degrees Centigrade while the numbers in the body of the table are degrees Fahrenheit.

To convert 190°C to Fahrenheit scale find 19 in the left column and 0 in the top column. Find 374°F in the horizontal line.

Conversion Formulae : $T^{0}C = 5/9\ (T^{0}F - 32)$
$T^{0}F = 9/5\ (T^{0}C + 32)$

^{0}C	^{0}F	^{1}F	^{2}F	^{3}F	^{4}F	^{5}F	^{6}F	^{7}F	^{8}F	^{9}F
–2	–4	–6	–8	–9	–11	–13	–15	–17	–18	–20
–1	14	12	10	9	7	5	3	1	0	–2
–0	32	30	28	27	25	23	21	19	18	16
0	32	34	36	37	39	41	43	45	46	48
1	50	52	54	55	57	59	61	63	64	66
2	68	70	72	73	75	77	79	81	82	84
3	86	88	90	91	93	95	97	99	100	102
4	104	106	108	109	111	113	115	117	118	120
5	122	124	126	127	129	131	133	135	136	138
6	140	142	144	145	147	149	151	153	154	156
7	158	160	162	163	165	167	169	171	172	174
8	176	178	180	181	183	185	187	189	190	192
9	194	196	198	199	201	203	205	207	208	210
10	212	214	216	217	219	221	223	225	226	228
11	230	232	234	235	237	239	241	243	244	246
12	248	250	252	253	255	257	259	261	262	264
13	266	268	270	271	273	275	277	279	280	282
14	284	286	288	289	291	293	295	297	298	300
15	302	304	306	307	309	311	313	315	316	318
16	320	322	324	325	327	329	331	333	334	336
17	338	340	342	343	345	347	349	351	352	354
18	356	358	360	361	363	365	367	369	370	372
19	374	376	378	379	381	383	385	387	388	390
20	392	394	396	397	399	401	403	405	406	408
21	410	412	414	415	417	419	421	423	424	426
22	428	430	432	433	435	437	439	441	442	444
23	446	448	450	451	453	455	457	459	460	462
24	464	466	468	469	471	473	475	477	478	480
25	482	484	486	487	489	491	493	495	496	498
26	500	502	504	505	507	509	511	513	514	516
27	518	520	522	523	525	527	529	531	532	534
28	536	538	540	541	543	545	547	549	550	552
29	554	556	558	559	561	563	565	567	568	570
30	572	574	576	577	579	581	583	585	586	588

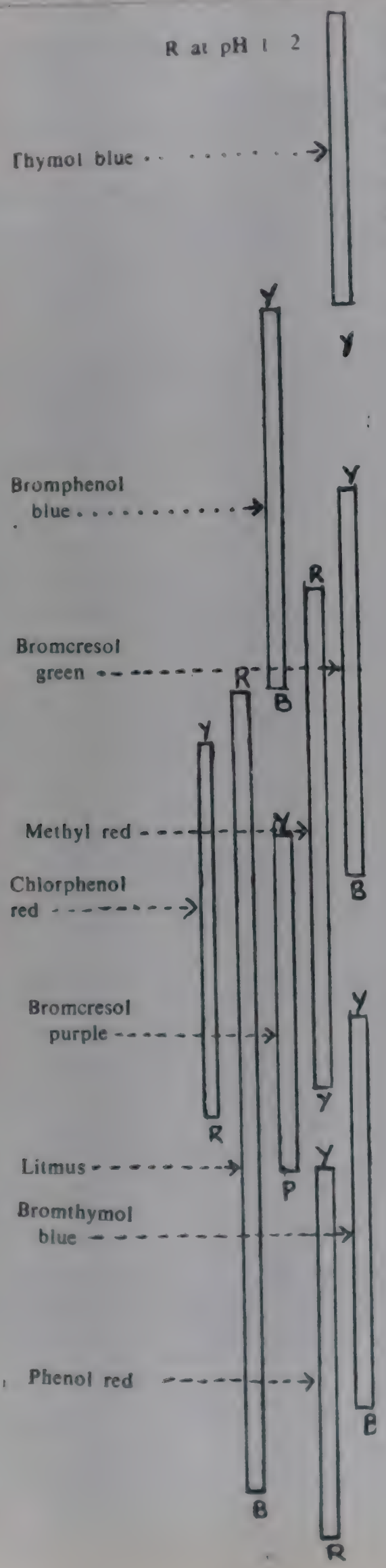
Thickening and Jellying Agents

Thickening Agent	Uses and Quantity required	Precautions in mixing	Effect of Temperature	Other factors affecting thickening	Characteristics of the gel
AGAR	Salad and dessert jellies. 1 S per cup (2g)	Soak in 3 to 6 times the weight of cold liquid, then dissolve by bringing to a boil.	Gel forms on cooling to 40° to 45°C (104° to 113°F); softens at 80°C to 85°C (170° to 185F°).	Gel strength not easily destroyed by heat or acid.	Gel rigid, short, crumbly; transparent; may have weedy odour if sample not highly purified.
CORNSTARCH and RICE STARCH	1 S cornstarch or rice starch= 2 S maida	Same as Maida	Same as Maida	Same as Maida	Pastes more translucent than maida
EGG	Custard puddings and sauces: I to 1½ medium eggs per cup of milk or double this number of yolks	Blend well with sugar and milk. Coagulate by slow heating.	Overcooking causes syneresis (weeping) and curdling.	Sugar and dilution raise coagulation temperature; acid lowers it. Use of water instead of milk results in a flocculent precipitate rather than a gel.	Baked custard forms firm, continuous clot. Stirred custard is soft, thickened but not set.
GELATIN	Molded desserts and salads; (1 envelope ≈ 3 S) 1½ S per cup (3½–6g).	Soak in 3 to 6 times the weight of cold liquid, then dissolve by heating to 40°C (104°F) or by adding hot liquid. Add sugar after gelatin is dissolved.	Gel forms after a few hours chilling. Softens at 26.5°C. (80°F) and higher.	Heating with acid causes reduction of gel strength. Raw pineapple prevents setting, due to enzyme action.	Gel firm but springy and quivery; transparent in appearance.
GUM TRAGACANTH	Salad dressings, sauces: 1–½ g per cup gives thin paste; 3 to 4 g per cup gives thick gel.	Dissolve either in hot or cold water (dissolves much more rapidly in hot.)	Little change in viscosity over a wide temperature range; almost as thick at high temperatures as low.	Acid, alkali, or salt plus heat causes thinning.	Gel thick and mucilaginous but not rigid even at high concentrations.

Thickening and Jellying Agents — *Concluded.*

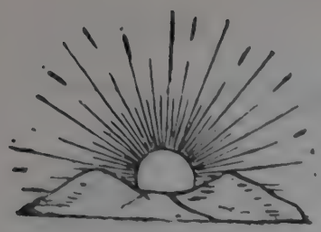
Thickening Agent	Uses and Quantity required	Precautions in mixing	Effect of Temperature	Other factors affecting thickening	Characteristics of the gel
IRISH MOSS	Puddings, sauces: 2 to 3 g per cup gives a thick paste; 8–12 g per cup gives a stiff gel.	Soak in cold water, then heat to 60°C (140°F) or above to dissolve.	Gel melts at 27° to 41°C (81° to 106°F) depending on concentration.	Acid plus heat causes thinning. Heat alone has no effect.	Gel thick and mucilaginous; becomes rigid only at high concentrations; may have weedy odour if not highly purified.
MAIDA (Flour)	Thin soup or sauce: 3 S (7. 5 g) per ¼ litre or cup. Medium sauces : 6 S per cup. Souffles. molded pastes: 12 S per cup.	Disperse in cold liquid or in fat or mix with sugar before adding hot liquid Stir while cooking.	Heat to 90°C (194°F) or above to obtain maximum thickening. Viscosity increases on cooling.	Heating with acid causes thinning. High sugar concentrations retard gelatinization and reduce thickening power.	Pastes opaque.
POTATO STARCH and ARROWROOT STARCH	1 S potato or arrowroot starch= 2 S maida (see effect of temperature). Suitable for starch–egg mixtures or fruit sauces where higher temperatures are not desired.	Same as Maida	Reaches maximum thickening at 70° to 80°C (158° to 176° F); higher temperatures on further heating causes very marked thinning.	Same as Maida; thinning also brought about by excessive stirring.	Pastes very transparent.
TAPIOCA PEARL (SAGO)	About twice as much as quick–cooking tapioca.	Soak several hours before cooking.	Cook until tapioca is transparent.	Same as quick-cooking tapioca.	Same as quick-cooking tapioca
TAPIOCA (SAGO) QUICK-COOKING	Puddings: 4½ S per cup liquid. Fruit pie fillings: 5–9 S for 8 or 9 inch pie. Soup: 1½–3 S per cup liquid	Mix in cold or hot liquid; no soaking neceasary.	Bring only to a boil. Mixture thickens as tapioca particles swell and become transparent. It continues to thicken while cooling.	Stir while cooking. Overstirring while cooling tends to disrupt tapioca particles, resulting in a sticky gelatinous mixture.	Pastes transparent non-homogeneous (particles remain distinct). Mixture thickens as it cools. Well suited for fruit pie fillings.

HYDROGEN ION CONCENTRATION AND P^H OF SOME COMMON FOODS



COMMON INDICATOR CHANGES *	HYDROGEN ION CONCENTRATION	P^H	AVERAGE VALUES FOR COMMON FOODS
	1.0×10^{-2}	2.0	Limes
	8.0×10^{-3}	2.1	
	6.3×10^{-3}	2.2	Lemons
	5.0×10^{-3}	2.3	
	4.0×10^{-3}	2.4	
	3.2×10^{-3}	2.5	
	2.5×10^{-3}	2.6	
	2.0×10^{-3}	2.7	
	1.6×10^{-3}	2.8	
	1.3×10^{-3}	2.9	Plums, Venegar
	1.0×10^{-3}	3.0	Gooseberries
		3.1	Apple, Grapefruit, Prunes (3.0 to 3.3)
		3.2	dill pickles, rhubarb
		3.3	Apricots, blackberries
		3.4	Strawberries, lowest acidity for jelly
		3.5	Peaches
		3.6	Raspberries, sauerkraut
		3.7	Blueberries, oranges (3.1 to 4.1)
		3.8	Sweet cherries
		3.9	Pears
	1.0×10^{-4}	4.0	Acid fondant, acidophilus milk
		4.1	
		4.2	Tomatoes (4.0 to 4.6)
		4.3	
		4.4	Lowest acidity for processing at 100° C
		4.5	Buttermilk
		4.6	Bananas, egg albumin, figs, isoelectric point for casein, pimentos
		4.7	
		4.8	
		4.9	
	1.0×10^{-5}	5.0	carrots, pumpkins
		5.1	Cucumbers
		5.2	cabbage, squash, turnips
		5.3	Beets, parsnips, snap beans
		5.4	Bread, sweet potatoes
		5.5	Spinach
		5.6	Asparagus, cauliflower
		5.7	
		5.8	Meat, ripened
		5.9	
	1.0×10^{-6}	6.0	Carrots, tuna fish
		6.1	Potatoes
		6.2	Peas
		6.3	Corn, dates, oysters
		6.4	Egg yolk
		6.5	
		6.6	Milk (6.5 to 6.7)
		6.7	
		6.8	
		6.9	Shrimp
	1.0×10^{-7}	7.0	Meat unripened
		7.1	
		7.2	
		7.3	
		7.4	
		7.5	
		7.6	
		7.7	
		7.8	
		7.9	
	1.0×10^{-8}	8.0	Egg white (7.0 to 9.0)
		8.1	
		8.2	

* B = Blue P = Purple
R = Red Y = Yellow



Food Buying Guides

Food item and form	Market unit AP	EP	Approximate Volume or number per market unit	Approximate number of servings per market unit ‡‡	size	weight per cup in grams
DAIRY PRODUCTS						
Butter	500 g		2 1/5 c	55	2 S	225 *
Cheese	250 g		10 pkts.	10	25 g	
Cheddar	1 kg		8 4/5 c			119
cottage						248
cream						241
Cream						250
cow, light						252
heavy						248
sour						257
Milk						
buttermilk	1024 g		1 l.			256
buffalo, whole	972 g		1 l.			243 *
cow, whole	984 g		1 l.			246 *
dairy standard	968 g		1 l.			242 *
dairy toned	984		1 l.			246 *
yoghurt						258
condensed, sweetened						321
evaporated						265
dry whole	1 kg		7 4/5 c			127
dry, non fat	1 kg		7 1/5 c			138
Milk desserts						
ice cream						149
sherbet						203
EGGS						
whole, fresh medium	12		1 4/5 c	12	1	255
frozen whole	12		1 4/5 c			255
dried, sifted whole	500 g		5 2/5 c			91
whites, fresh medium	12		4/5 c			246
frozen	500 g		1 1/2 c			258
dried, sifted	500 g		5 1/5 c			94
yolks, fresh medium	12		3/5 c			245
frozen	500 g		2 C			258
dried, sifted	500 g		5 4/5 C			84
FATS AND OILS						
butter						225
ghee						223
lard						231
margarine	500 g		2 1/5 C			235
oils—corn, cottonseed,						
groundnut, soya	1 l.		4 C	(1 S = 6 g)		222 *
gingelly	1 l.		4 C			220 *
vanaspathi	1 kg		4 3/5 C			215 *

* indicates research was done by us.

Food item and form	Market Unit AP	Market Unit EP	Approximate Volume or number per market unit	Approximate number of servings per market unit ‡‡	Size	weight per cup in grams
FISH AND SHELL FISH						
Fish dressed	1 kg	436 g		5	85 g	
fillets	1 kg	623 g		7 1/3	85 g	
steaks	1 kg	561 g		6 2/3	85 g	
whole	1 kg	280 g		3 1/3	85 g	
frozen						
breaded portion	½ kg	500 g		5 4/5	85 g	
sticks	½ kg	500 g		5 4/5	85 g	
Fish tinned						
mackerel		425 g			85 g	191
salmon						176
sardines						
in brine)						168
in oil)						178
tuna						
Shellfish						
Clams						
hard	12			6	2	
fresh, frozen						
shelled	1 kg			11 1/2	85 g	
tinned		200 g		2	85 g	166
Crabs						
fresh in shell						
Blue	1 kg			1 1/2	85 g	
Dungeness	1 kg			2 2/3	85 g	
Meat, tinned		170 g		2	85 g	171
Labsters						
fresh, frozen						
in shell	1 kg	233.75		2 3/4	85 g	
meat	1 kg	1000		10 2/5	85 g	162
Oysters						
live in shell	12			6	2	
fresh, frozen shelled		500 g		3	82 g	247
tinned, whole		227 g		2	82 g	164
Scallops						
fresh, frozen, shelled		500 g		3 1/2	82 g	
Shrimp						
raw in shell	500 g			3	82 g	
raw, peeled		500 g		3	85 g	
tinned		113 g		1 1/4	85 g	135

Food item and form	Market Unit AP	Market Unit EP	Approximate Volume or number per market unit	Approximate number of servings per market unit ‡‡	size	weight per cup in grams
FLOURS, CEREALS, ETC.						
Bread, sliced	¼ kg		10 slices	5	2	
crumbs, dry						19
crumbs, soft						48
Cereals—						
Bajra						
Barley						
Bulgur	1 kg			2	½C	170
Hominy, grits	1 kg		6 3/5C			
Cooked			23C	13	3/5C	162
Hominy, whole	1 kg		5 4/5C	3/5C		248
Maize cooked	1 kg		36 2/5C			191.10
Maize (see flour)						250
Oats, rolled	1 kg		6 3/5C			
cooked	1 kg		8 1/2C			76
Ready to eat cereals						252
flaked						
granulated						34
puffed						88
shredded						24
Pasta						39
macaroni 1" pieces	½ kg		4 1/2C			
cooked			10C	18	1/2C	129
macaroni, shell	½ kg		4 1/2C			147
noodles, 1" pieces	½ kg		7C			121
cooked			9C			77
spaghetti, 2" pieces	½ kg		4 1/2C			
spaghetti cooked			10C			99
Ragi, coarse	1 kg		5 3/5 C			168
Rice–polished						180*
long grain				3/5C		191.10
medium grain						200*
short grain				3/5C		210
Parboiled, raw						199*
Precooked						194
Sooji (raw)	1 kg		6 1/5C	3/5C		
coarse	1 kg		5 3/5C			160
fine						174*
Soy, grits (lowfat)	1 kg		6 3/5C			156
Wheat, broken						156*
Wheat, whole						198*
Crackers,						
cream–fine crumb	½ kg		6–7C			73
saltine	½ kg		140 nos			
Flours						134
corn (starch)						135
maize white						60
yellow						160
cooked as cereal						250

* indicates research was done by us

Food item and form	Market unit AP	Market unit EP	Approximate Volume or number per market unit	Approximate number of servings per market unit ‡‡	size	weight per cup in grams
Flours contd.						
ragi	1 kg		7 3/5C			133
rice, sifted	1 kg		7 3/5C			132
rice unsifted	1 kg		5 3/5C			166
rye, dark sifted	1 kg		7 3/5C			133
light sifted			10 1/5C			89
soy, full fat	1 kg		15 1/5C			63
soy, low fat			11 C			87
cake, sifted	1 kg		9 4/5C			101
maida, sifted	1 kg		8 1/5C			121
maida, unsifted	1 kg		7 3/5C			131
whole wheat, stirred			7 4/5C			126
FRUITS						
amla	100g	63g*	12 small			
Apples						
dried, sliced uncooked	1 kg		9 C			109
dried, cooked			18 C	36	1/2C	256
fresh, med, whole	1 kg		6–7	6	1	
pared diced			5 1/5C	10	1/2C	128
sauce, cooked, tinned	450 kg		1 3/5C	3	1/2C	272
Juice	590 ml		2 1/5C	4	1/2C	261
Apricots						
dried, whole raw						261
dried. raw without seed						157
fresh whole	500g		10	5	2	121
tinned whole	454g			5	2/5C	236
Avocado						
fresh diced	1 kg		5 3/4C		2/5C	149
Bananas						
dried	1 kg		10 2/5C			105
fresh, whole	12		1 1/5C		1	
mashed	1 kg		6 3/5C		1/2C	244
sliced	1 kg		4 3/5C		1/2C	149
Blueberries						
cooked	397g		1 1/2C	3	1/2C	178
fresh	1 kg		4 2/5C	4	1/2C	153

Food item and form	Market Unit AP	EP	Approximate volume or number per market unit	Approximate number of servings per market unit ‡‡ size	weight per cup in grams
Cherries, red					
cooked, pitted	1 kg		4 2/5 C	10 2/5 C	186
fresh, pitted	1 kg		5 1/5 C	10 1/2 C	162
Currants, dried	1 kg		7 C		147
Dates, dried					
pitted, halved	1 kg		5 C	11 1/2 C	187
whole	1 kg		120		
Figs					
dried, cut fine	1 kg		54/5 C	1 4 2/5 C	176
fresh	1 kg		27	9 3 med	
trimmed	454 g		15		241
Grape fruit					
cooked sections	450 g		1 4/5 C	4 2/3 C	253
raw sections					204
fresh, med.	1 kg		2 med.	4 1/2	
Grapes, fresh					
seeded	1 kg		5 C	10 1/2 C	193
seedless	1 kg		5 2/5 C	11 1/2 C	177
Guava					
fresh, medium whole	1 kg		5		
Jackfruit	230 g	56g*	$\frac{1}{3}$ med.		
Lemon, juice	12		1 4/5 C		259
medium whole	1 kg		9		
Lime	1 kg		12		
Loquot					
Mango	86 g	60g*	1 med.		
whole	1 kg med.		4		
Melon, fresh diced					243
Oranges-juice	12		3 4/5 C		259
Mosambi-med.	1 kg		4-5		

Food item and form	Market Unit AP	Market Unit EP	Approximate volume or number per market unit	Approximate number of servings per market unit ++	size ++	weight per cup in grams
Papaya, fresh, med· diced	450 g	293 g	1 med.			150 g
Peaches						
cooked, dised tinned	450 g		1 4/5 c		1/2 C	229
dried	1 kg		6 4/5 C			168
fresh, med. whole	1 kg		8 medium	8	1	
Fresh diced	1 kg		4 2/5 C	8	1/2 C	193
Pears						
halves, tinned	450 g		6—10 halves	3—5	2/5 C	238
fresh, whole	1 kg.		4 medium	8	1	
fresh, diced			5 3/5 c	8	1/2 C	166
Pineapple						
fresh, diced	1 kg		6 1/5	6	1/2 C	143
fresh, whole	1 kg		1 medium (3 c)			
tinned chunks	822 g		3 3/5 c	7	1/2 c	208
tinned sliced	567 g		10 slices	2	5	218
tinned crushed	822 g		3 c	7	2/5 c	273
Plantain (see Bananas)						
Plums						
fresh, halved	1 kg		16—40 (5 c)	10	1/2 c	194
tinned whole	450 g		10—14 (1 4/5 c)	3—6	2—4	234
Pomegranate	1 kg		3 med			
Pomelo						
fresh, section						
fresh whole	1 kg		1 1/2 med			200
Raisins, dried						
seeded whole	500 g		3 1/5 c			149
seedless whole			3 1/5 c			153
Rhubarb	1 kg		8—16 pieces			
cooked, diced			3 4/5 c			254
fresh, diced			7 2/5 c			128
frozen, diced			5 2/5 c			176
Strawberries						
fresh, sliced	500 g		3			155
Fresh, whole			3 1/5 c			151

Food item and form	Market unit AP	EP	Approximate volume or number per market unit	Approximate number of servings per market unit ‡‡	size	weight per cup in grams
LEAVENING AGENT						
Baking Powder						
Phosphate						4.5 g/s
SAS Phosphate						3.5 g/s
Tartrate						3.2 g/s
Bicarb. soda						4.4 g/s
Cream of Tartar						3.4 g/s
Yeast, dry						2.7 g/s
MEAT						
Fresh or frozen						
bacon	1/2 kg		26 slices			
boned-ground						238
cooked						149
minimum bone	1 kg			3—4		
maxium bone (shoulder, short rib)	1 kg			2—4		
frankfurters	1 kg		14—20 pieces			
Ham, cooked diced	1 kg			3—5		154
tinned sliced						
Luncheon—diced						148
Buffalow, diced						
Goat, diced						
Mutton, diced						
POULTRY						
Chicken–ready to cook						
fryer	3/4—1½ kg		2—4 servings			
roaster	1 kg		3—5 C			
stewer	1 kg		2—4 C			
cooked boned, diced	1 kg		4—6 C			143
raw, boned diced						
Duck	1 kg			4—5		
Goose	1 kg			4—5		
Turkey	1 kg			2—4		
cooked, boned, diced				2—4		140

Food item and form	Market unit		Approximate volume or number per market unit	Approximate number of servings per market unit		weight per cup in grams
	pieces AP	EP		++ ++	size	
SUGARS AND SYRUPS						
Brown, packed	1 kg		4 2/5 C			223
Granulated	1 kg		6 3/5 C			160
Icing sugar, unsifted						129
sifted	1 kg		6 3/5 C			100
Syrup						
corn	1 kg		4 3/5 C			344
honey	1 kg		3 C			349
jaggery	1 kg		3 2/5 C			324
VEGETABLES						
Amaranth mature chopped	100 g	91 g *				40
Asparagus, tinned	400/g			5	2/5 c	195
banana blossom	658 g	152 g *	1 med			
Beans	100 g	75 g *				
avarai	1 kg cut					89 *
broad	1 kg cut					146 *
cluster	1 kg cut					100 *
double, fresh raw	1 kg		4 3/5 C			163
tinned	454 g		2 1/2 c	6	2/5 c	178
french, raw	1 kg cut					95
tinned	454 g		4 c	8	2/5 c	111
kidney, cooked			12 3/5 C			194
dried. raw	1 kg		5 3/5 C			193
navy, dried	1 kg		5 1/3 C			179
Beet root	1 kg cubed		4 3/5 C			100 *
Brinjal	1 kg cubed		5 3/5 C			83 *
Broccoli, cooked	1 kg		4 3/5 C			172
Brussels Sprouts	1 kg quartered		9 1/5 C			83 *
Cabbage, cooked	1 kg		4 3/5 C			153
Cabbage, shredded—raw			9 1/5 C			
Capsicum						84
Carrot, diced cooked	1 kg cubed		4 3/5 C			103 *
diced raw						100 *
cooked						131
Cauliflour	1 kg 1 med. head separated		3 3/5 C			70 *
Chow Chow, cubed,						125 *
Celery cooked	1 kg		4 3/5 C			161
raw						127
chillies, dry						

* indicates research was done by us.

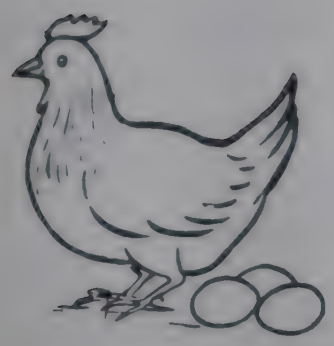
Food item and form	Market Unit AP	EP	Approximate volume or number per market unit	Approximate number of servings per market unit ‡‡ size	weight per cup in grams
Colocasia whole			small		90
Cow gram, fresh					145
Drumstick, Cut 2 cm	150 g	93 g *	3 med		82
Gourd					
ash, cubed,					100
bitter, sliced					83
snake, sliced					100 *
Greens, Fresh	1 kg		12 3/5 C		
agathi	100 g	448 *			
amaranth, chopped, tender	100 g	81 g *			38 *
colocasia,	120 g	99 g *	5 small		
Drumstick leaves	100 g	50 g *			
Fenugreck leaves mehthi leaves		100 g	38 g *		
radish top	75 g	62 g *			41 *
Ladies Finger ¼" piece	1 kg		5 2/5 C		85 *
tinned					180 *
Lentils/Pulse					
Bengal gram whole	1 kg		1 1/4 litre		200 *
Bengal gram dhal	1 kg		1 1/4 litre		200 *
Cow gram dhal	1 kg		1 1/4 litre		200 *
green gram dhal	1 kg		1 1/4 litre		200 *
horse gram					196 *
red gram dhal	1 kg		1 1/4 litre		205 *
peas dry	1 kg				190 *
Maize, cut raw					173
cut cooked					142
Mushroom, fresh sliced	1 kg		5 C		71 1/5
tinned					169
Onion, fresh					
chopped	1 kg		4 3/5 C		142
large mature	1 kg		6/5 C		
cooked					207
Parsnip cooked			4 3/5 C		222
fresh	1 kg		8 medium		50
Paruppukeerai, chopped	100 g	75g			
Peas,					
fresh			5 1/3 C		170
Blackeye – fresh					141
dried, split, raw,					210
dried, split, cooked					260
English	1 kg				
shelled			2 1/5 C		150

* Indicates research was done by us.

Food item and form	Market Unit AP	Market Unit EP	Approximate volume or number per market unit	Approximate number of servings per market unit ‡‡ size	weight per cups in grams
English peas					175
cooked					210
split, dry	1 kg		5 1/5 C		204
split, dry, cooked			11 C		
					172
Potato, fresh (white)	1 kg		7 medium		150 *
diced, peeled	104 g	81g	1 med		217
cooked, mashed			4 C		
Pumpkin					109 *
yellow,					259
cooked, mashed	1 kg		2 1/5 C		
					197
Sauerkrant	450g		2 C		143
Squash, fresh					
Sweet potato	1 kg		6–8 medium		125 *
diced, peeled	107g	99g			230
tinned	300g		2 C		140 *
Tapioca					
Tomato, fresh	1 kg		7med		
tinned, whole	450g		2 C		250
tinned sauce	225g		4/5 C		271
Turnips, cooked	450g		2 C		205
diced, peeled					100 *
Yam (elephant)	175g	172g	¼ med		125 *
MISCELLANEOUS					
Catsup, Tomato					287
Cherries, whole, candied	450g		2 C		208
Chocolate					236
Cocoa					118
beverage mix					146
Coconut					
desiocated					84
fresh, grated					90
Coffee	1 kg		11 ½ C		89
brewed			100 C		
instant	500g		2 C	500 1 ss/cup	

* indicates research was done by us.

Food item and form	Market Unit AP	EP	Approximate volume or number per market unit	Approximate number of servings per market unit ‡‡	size	weight per cup in grams
Gelatin—Jelly Crystals						
flavoured packet	88 g		2/5 C			188
prepared			2 1/5 C			585
granules, plain						157
Mayonnaise						255
Nuts, shelled						
almonds blanched	½ kg		3 2/5 c			160
cashew						140
groundnut, fresh						170
groundnut, dry with skin						151
pecan, halved						113
chopped						124
pistachio						131
Walnut, English						
chopped						130
halved						105
Peanut butter	500 g		2 C			272
Sago—regular	500 g		3 1/2 c			140
quick cooking	500 g		3 1/5 C			160
Salt, table	500 g			(1 S = 6 g)		140
SPICES						
Cardamon whole				(1 S = 11 g)		
seeded				(1 S = 16 g)		
Chillies—dry	100 g		3 3/5 C	(1 S = 0. 5 g)		
Clove, whole	100 g			(1 S = 2 g)		
Coriander seed	100 g		1 2/5 C	(1 S = 1. 4 g)		
Cummin seed	100 g		1 C	(1 S = 2 g)		
Penugreek	100 g		0.56 C or 28 S	(1 S = 3.25 g)		
Garlic segments	100 g		4/5 C	(1 S = 2.75 g)		
Mustard seed	100 g		4/5 C	(1 S = 2.5 g)		
Pepper, black powder	100 g		3/5 C	(1 S = 3 g)		152 g
Tamarind pulp	100 g		4/5 C	(1 S = 2.6 g)		
Tarragon leaf						
Thyme leaf						
Turmeric – 1″ pieces						
powder						
TEA						
leaves	500 g		6-8 C			76
brewed			1 C leaves	300	1 cup	
instant	125 g		2 C	192	½S cup	62
Water						250



Eggs

An *egg* consists of the outer shell, the shell membranes, the air cell, the egg white (thick and thin albumen), the yolk membrane, the yolk, and the chalazas.

Egg shell colour may vary from white to deep brown. Colour is a breed characteristic, not affecting the flavour, the nutritive value or the cooking performance. The shell colour is also not a guide to the yolk colour.

Quality and weight of eggs vary. Quality is determined by cleanliness and soundness of the shell, size of the air cell, and by the interior quality of the egg which is judged by candling. Eggs of high quality have a large thick white which stands high around a high, firm yolk. There is a little thin white around the outside edge of the egg. As the egg loses quality, the air cell becomes larger due to moisture loss. The thick white becomes thin. The yolk floats to the side or top of the egg. When broken out on a plate, the lower quality egg has a flattened yolk and the white is watery and thin.

Candling consists of holding and turning the egg before a beam of light strong enough to observe the interior. The position of the yolk, the condition of the thick and thin white and the size of the air cell determine the interior quality.

An *egg* of average size *weighs* approximately 56 grams of which the shell is 11 percent, the white 58 percent, and the yolk 31 percent. The weight of a dozen eggs is approximately :

Size of egg	weight per dozen		
	kg.	*oz.*	*lb.*
Extra large	0.763	27	1 lb. 11 oz
Large	0.682	24	1 lb. 8 oz
Medium	0.596	21	1 lb. 5 oz
Small	0.511	18	1 lb. 2 oz
Very small	0.426	15	

Converting prices to weight will help to determine the money value of the different sizes of eggs.

The *percentage composition* of the edible portions of eggs are:

Composition	Whole Egg	Egg white	Egg yolk
ash	01.0%	0.82%	01.5%
fat	10.5	0.05	31.6
protein	13.4	10.00	16.7
water	73.7	87.77	49·0

Eggs are used in the preparation of beverages, breads, cakes, cereal, cheese, dishes, salad dressings, salads, sandwiches, sauces, soups and in fish, meat and vegetable dishes. In cookery, eggs may be used to :

add colour, richness and flavour to individual dishes

bind as in cutlets and meat loaf

clarify as in consomme or boiled coffee

coat as in breaded cutlets and meats

emulsify as in cream puffs, mayonnaise and salad dressings

garnish as with canapes, pilaf, salads and soups

hinder crystallization in candy making

leaven when beating to incorporate air as in cakes

thicken custards, puddings, and sauces

When combining hot mixtures and eggs such as custards and souffles, pour the hot mixture slowly into the beaten egg, stirring or beating constantly.

In addition to fresh eggs from the chicken there are duck eggs and eggs in different forms. *Dried Egg Solids.* Dried eggs may be whole, egg whites plain yolks, sugared yolks. salted yolks and blends of whole eggs or yolks with other ingredients. Dried whole eggs are broken out of the shell and made into a homogeneous mass before drying. Dried sugared or salted yolks are a blended product usually consisting of 90 percent yolks and 10 percent of either salt or sugar by weight. Dried egg whites are processed

without added ingredients. In the processing they may be cut by rapidly revolving blades or passed through fine screens to break down the thick white which will cause them to whip faster when reconstituted.

Duck Eggs. Duck eggs are usually somewhat larger than chicken eggs, have a thicker shell, tougher membrane, and a stronger flavour. The beaten texture is not as light as that of chicken eggs. Though satisfactory for most baking, they should be used somewhat cautiously because of their texture.

Frozen Eggs. Frozen eggs may be whole, egg whites plain yolks, sugared yolks, salted yolks, and blends of whole eggs or yolks with other ingredients. Frozen whole eggs are broken out of the shell and made into a homogeneous mass before freezing. Frozen egg yolks contain not less than 43 percent total egg solids. Frozen sugared or salted yolks are a blended product usually consisting of 90 percent yolks and 10 percent either salt or sugar by weight. These yolks thaw out smoothly without formation of gummy or lumpy particles. Frozen egg whites are frozen without added ingredients. They may be cut by rapidly revolving blades or passed through fine screens to break down the thick white for faster whipping.

STORAGE AND USE. Eggs should be stored in the refrigerator with large end up unless treated for room storage. For best flavour and cooking quality refrigerated eggs should be used within a week, untreated non-refrigerated eggs within two days unless they have been specially treated and then the length of time would be dependent on the instruction because of the type of treatment given. Eggs stored in a refrigerator in a tightly closed container with the temperature between 7°C and 10°C may be kept up to six weeks. During this time they will slowly lose carbon dioxide and water, causing the yolks to flatten and the whites to spread.

High quality, fresh eggs are best for cooking in the shell, poaching, frying, and for such preparations as Angel Food cake. Lower quality and less fresh eggs may be used for other cooking without altering the food preparation and may be more economical to purchase.

Dried, frozen, cracked eggs, and eggs with soiled shells should be used only in foods to be well cooked.

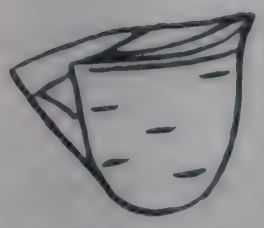
To store *egg whites*, refrigerate tightly covered and use within a week. To store *egg yolks*, cover with cold water and refrigerate in a covered container. When ready to use, remove from the water. Use within three days. The yolks may also be hard cooked for use in salads and sandwiches.

Hard cooked whole eggs may be kept refrigerated in a closed container for one week.

WHIPPING OF EGGS. Whole eggs well beaten increase in volume 4 to 6 times and have a moist, soft, foam. Eggs beaten when they are at room temperature give the best volume. Drainage is rapid, indicating the need to beat them when just ready for their use.

Eggs are beaten in different ways. *Egg whites beaten stiff* is beating until they stand in peaks that just bend over when the beater is lifted, the surface being moist and glossy. *Egg whites very stiff* is beating until the surface is dry and the peaks stand straight. *Egg yolks well beaten* is beating until they are thick and lemon coloured. *Whole eggs slightly beaten* is beating until the whites and yolks are just blended. *Whole eggs well beaten* is beating until they are a light frothy colour.

Egg whites whip to a greater volume than other foods but have a more rapid drainage unless stabilized. To improve the stability and volume of egg white foam, separate yolks from the white before beating because fat which is in the yolk inhibits egg whites from foaming action. Have the egg whites at room temperature or between 18°C and 25°C, add one spoon of cream of tartar to each cup of egg whites to increase stability (this increases whipping time), and, add sugar slowly when called for in the recipe.



FATS AND OILS

FATS AND OILS are substances of animal and plant origin consisting largely of the glyceryl esters of fatty acids. Organic fatty acids have a straight hydrocarbon chain and an even number of carbon atoms. Short chain saturated fatty acids are liquidor soft at room temperature. As the fatty chain length increases the fat becomes harder. Unsaturated fatty acids have at least one double bond in the hydro–carbon chain and are liquid at room temperature. When a fat has a large proportion of fatty acids with more than one bond they are polyunsaturated.

"Fat" is the term commonly used for those fats that are solid at room temperature ; "oils" those that are liquid at room temperature. Salad oils have been processed to remove higher melting portions so that they remain liquid at refrigerated temperatures. Cooking oils may become cloudy and thick at low temperatures.

FATS Hydrogenated all—vegetable shortenings are solidified oils of cotton seed, soybean, peanut or corn oil.

Free fatty acids are removed from the oils and then colouring materials are removed through a bleaching process with absorbent materials. The purified oils are then hydrogenated through a process where hydrogen is added to change the oil from a liquid to a solid. The "fat" (hydro–genated oil now solid) is deodorized through a process where steam is applied under high vacuum at high temperatures until a bland flavour is produced.

Plasticizing is the final procedure and consists of rapidly chilling the hot fat and incorporating either air or inert gas into it to produce a soft, creamy texture.

Most hydrogenated vegetable shortenings contain small amounts of mono–and di–glyceride fats. These fats improve the over–all baking performance of the shortening.

Lard is fat rendered from the fatty tissues of pork. Lard may be smooth or slightly grainy in texture, it may be light or dark in colour; and strong or bland in flavour, depending on processing and production procedures.

Butter (see dairy products)

Margarine is made of no less than 80 percent fat. Vegetable oils (see above) or a mixture of animal and vegetable oils may be used in margarine—the label should state the type of fat or fats used. The oils are refined, cultured with milk, crystalized and kneeded to produce a consistency similar to butter. Salt and colour are optional. Margarine may be enriched with the addition of vitamins to make the food value equal to or greater than butter.

Poultry fat is rendered, usually from the leaf fat taken from the body cavity of chickens, ducks, geese and turkeys ; sometimes from the fat which separates when poultry is cooked. Poultry fat, when cold, is firm, light in colour and bland in flavour.

Drippings are fats rendered in the process of cooking fat meats or trimmings from meat such as bacon, beef, ham or mutton.

OILS. Most edible oils are of vegetable origin. *Vegetable oils* are prepared by crushing the fruit or seeds of plants with heavy pressure, or by dissolving it out with an organic solvent which is later evaporated off. The raw oils may be refined, bleached, and deodorized before being marketed. Salad oils are further treated by exposing them to low temperatures and then filtering them in order to remove the high melting portions of the oil that would otherwise cause the oil to become cloudy and perhaps thick at refrigerator temperatures.

Corn, cottonseed, olive, peanut, soybean, and safflower are the most frequent seeds, fruits or beans used for this type of oil extraction.

STORAGE AND USE. Store oils in capped bottles at room temperature unless they have been treated to prevent clouding or solidifying at refrigerator temperatures.

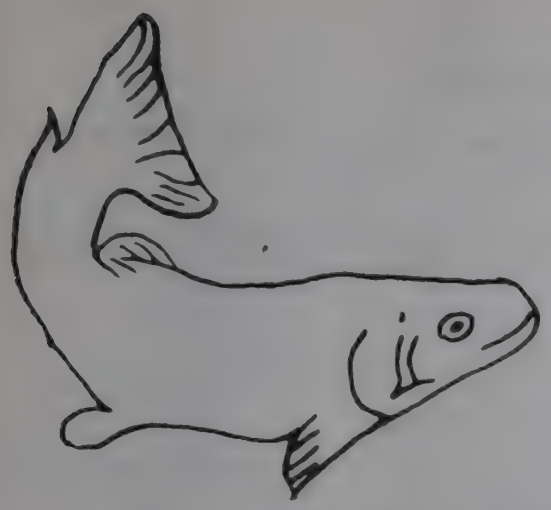
Vegetable shortenings may be kept at room temperature for short periods of time. They should be refrigerated when used over a period of several months.

Lards and home rendered fats should be refrigerated.

Refrigerated fats are more easily measured if first brought to room temperature.

Vegetable fats are better for frying than butter, margarine, or some lards because of their higher resistance to smoking or burning. A butter or margarine mixture with a vegetable fat has a higher smoking point than butter or margarine alone.

Use a half kg packet of butter as equivalent to about 2 cups.



Fish and Shellfish

Dehydrated fresh and frozen fish and fish products may be purchased in a variety of forms.

Whole fish are marketed just as they come from the water. Before cooking the fish is scaled, *eviscerated*, and the head, tail and fins are removed.

Dressed (large fish) or pan-dressed (small) fish are scaled and eviscerated, and usually the head, tail and fins are removed. Large fish are frequently cut into steaks or split.

Fillets are cut lengthwise away from the backbone down the sides of the fish. They are nearly boneless and may be marketed with or without skins (Fresh or Frozen).

Mackerel, Salmon, Sardines and Tuna are the most frequently available tinned fish. They may be packed in brine, in oil, or in tomato sauce.

Salmon may have different texture, colour, and flavour depending on the species. Better flavour and higher oil content varies by the colour of the salmon from deep red to pink.

Tuna is produced from species of the mackerel family and may vary from white meat to light meat. Solid pack is composed of cross-sectional cut pieces of tuna. Chunks, flakes, and grated tuna contains mechanically sized pieces of meat.

Market Forms of Shell Fish include :

Crabs may be purchased live in the shell, cooked in the shell, as cooked meat and tinned. Soft-shelled crabs have been caught just after they have shed their shells and before new shells have been fully formed. Three types of crab meat are : lump, consisting of white meat from the large body muscles ; flake meat from small pieces of white meat from the body ; and claw meat which is brownish in colour. The quantity of each type of meat from a single crab is determined by the species.

Lobsters may be purchased live or cooked in the shell (fresh or frozen) and tinned without the shell. Live lobsters are graded by size.

Small	1/4	—	1/2 kg
Medium	2/5	—	3/5 kg
Large	3/5	—	1 kg
Extra large	over 1		1/2 kg.

Scallops are taken from the large muscle which controls the shell movement of the mollusk. The meat may be cream, tan, orange or pink in colour. Scallope may be purchased fresh or frozen.

Shrimp may be purchased whole, headless or peeled raw, and peeled and frozen or cooked and tinned. There are approximately 100 headless medium sized shrimp in a kg.

Purchasing. Storage and Use : Fresh fish should be stored in closed containers at as low a temperature as possible without freezing the fish.

Frozen fish should be kept frozen until it is to be cooked. A 500 grams portion of frozen fish will thaw within 24 hours in the referigerator and in about an hour under cold water. Room temperature thawing of fish is not recommended due to the possibility of spoilage.

Any bulging, leakage, or swelling of tins of fish indicates spoilage.

Live oyster shells are either tightly closed or close quickly when tapped. Only live oysters should be purchased.

Frozen fish is of poor quality if it has any discolouration or a white cottony appearance.

Sea food may be kept as follows :

	Refrigerator	Freezer
cooked	3—4 days	2—3 months
fresh	1—2 days	4—6 months
salted, smoked	3—4 months	—
mildly cured	3—4 days	—

TIMETABLE FOR FISH AND SHELLFISH COOKING

Type of Fish or Shellfish	Weight or Number	Bake Temperature in °C	Bake Time	Broil Time	Simmer Time	Steam Time	Deep Fat 177°C	Pan Fry Time
Clams								
live	36	232	12 min	5 min	—	8 min	—	—
shucked	1 kg	177	10 min	5 min	—	—	3 min	5 min
Crab	2 kg	177	10 min	—	5 min	—	—	—
Fish								
chunks	1 kg	177	35 min	—	20 min	—	—	—
dressed	1½ kg	177	55 min	—	30 min	30 min	—	—
fillet/steak	1 kg	177	25 min	10 min	8 min	8 min	5 min	10 min
pan dressed	1½ kg	177	30 min	10 min	10 min	10 min	5 min	10 min
Lobster, live	3 kg	205	25 min	12 min	15 min	15 min	—	—
spiny tail	1 kg	177	25 min	12 min	12 min	12 min	—	—
Oysters								
live	36	233	12 min	5 min	—	—	—	—
shucked	1 kg	177	10 min	5 min	—	—	3 min	5 min
Scallops								
shucked	1 kg	177	25 min	7 min	5 min	4 min	3 min	5 min
Shrimp	1 kg	177	25 min	10 min	5 min	4 min	3 min	5 min

Fruits

FRUITS may be classified as follows :

Berries : Blackberry, blueberry, currant, gooseberry, grape, mulberry, raspberry, strawberry.

Citrus : Grapefruit, lemon, lime, orange, pomelo, sweet lime.

Drupes : apricot, cherry, nectarine, peach, plum.

Melons : cantoloupe, casaba, honeydew, watermelon

Pomes : apple, pear.

Tropical fruits include amla, avocado, banana, custard apple, date, fig, guava, kumquat, litchi, mango, papaya, passion fruit, persimmon, pineapple, quince, sapota and tamarind.

FRUIT SELECTION, STORAGE AND USE : **Fruit may be graded** according to appearance, maturity, decay and defects. They may furthur be separated according to size.

Dehydrated Fruits : Apples, currants, dates, figs mangoes, peaches, raisin, and tamarind are either sun-dried or dehydrated machanically to remove their moisture content. Most processes remove from 15 to 25 percent of the moisture while freeze drying allows 2 percent to remain.

The **quality of dried fruit** ranges from fancy to sub–standard. The size also ranges from very large to very small. Some may be graded according to size and quality, some according to size, alone, some according to quality alone and some may have no grading as to quality.

Tamarind pulp is commonly used much as is lemon or lime and as a condiment. Cakes of tamarind are made from fruit pulp by removing first the rind and then the fibrous matter and seeds enmeshed with pulp of the mature tamarind. The pulp is then sun or oven dried and compressed into cakes. The pulp may also be kept somewhat moist and stored in glass containers.

Tamarind pulp is graded as to follows :

Content	Grades			
	Special	Good	Fair	Average
Moisture maximum	15.0 %	15.0 %	15.0 %	15.0 %
Seed content maximum by weight	3.0 %	5.0 %	7.0 %	10.0 %
Extraneous matter by maximum weight	1.0 %	1.5 %	2.0 %	2.5 %
Ash (acid insoluble maximum on dry basis)	0.25 %	0.30 %	0.40 %	0.50 %

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FRESH FRUIT, SELECTION, STORAGE AND USE : Apples For good flavour, texture and storing ability apples should be taken from the tree when mature. Irregularly shaped brown spots (scald) on the skin may not affect the eating quality of apples. There are apple varieties for eating raw, tart apples for pies and sauces, and apples that hold their shape well in baking. Cut and peeled apples may be dipped into lime or lemon juice to avoid discolouration.

Poor quality apples may be bruised, shriveled, lack the natural colour of the variety (picked before mature), or soft, (overripe), or excessively hard (underripe).

Apricots. Ripe apricots will yield to gentle pressure of the thumb. They should look plump and have a uniform yellow–orange colour. Refrigerate uncovered and use within 5 days.

Over mature apricots have a dull appearance and feel very soft. Pale yellow or greenish–yellow apricots feel hard to touch and are underripe .

Avocados. Avocados for immediate use should feel slightly soft to gentle pressure on the skin. For later use, avocado should not yield under gentle thumb pressure and should ripen when kept at room temperature. Allow 3 to 5 days for firm avocados to ripen. Sprinkle cut avocado with lemon or lime juice to avoid discolouration. Irregular light brown skin markings do not affect the flesh of the avocado.

Cracks or dark indented spots indicate avocados that are in the process of decay.

Bananas. Bananas should be firm, bright in appearance and free from brusises or splits in the skin. The colour at the time of ripeness will vary with the variety.

Avoid bananas with a dull dry appearance and (old, improper ripening), bruised discoloured skins and split skins.

Green bananas ripen best between 15–20°C. Cold refrigerator temperatures affect the flavour and texture of bananas.

Blueberries. Blueberries should be plump, firm, a dark blue colour and have a silvery bloom (natural protective waxy coating.)

Blueberries that have a dull blue colour, shriveling of skin or are hard and somewhat green skinned should be avoided.

Cherries. Cherries should have fresh, unwithered looking stems, and have a plump glossy and unblemished surface. Cherries may be sweet or tart. Refrigerate cherries uncovered and use within 3 to 5 days. Over ripe cherries have shriveled stems, dull skin colour and lack flavour. They may also have decayed spots, cracks in the skin, and mould growth.

Chicku. Chicku should have a dull brown skin, plump appearance with slight yielding to finger pressure. Chicku should be avoided if shriveled, moulded or very hard.

Figs. Figs may be black, green or yellow. They should be firm, soft and have a smooth surface. Figs that have become so soft as to lose their natural shape or are dry, hard or withered, are in the process of decay or are too dry to be palatable.

Grapefruit. Grapefruit should be firm, feel heavy for its size, be rounded in shape, and have a smooth, thin feeling skin. Such skin defects as discolouration or surface scars do not usually affect the eating quality. Grapefruit may be white or pink with or without seeds. Grapefruit may be refrigerated without cover. A pointed stem end, rough, wrinkled skin, soft flesh to the skin, or light weight for the size are indications of thick skinned grapefruit and a lack of juice.

Discoloured areas that are soft (begins at the stem end), skin which breaks with finger pressure, and withered, dull skin are all indications of decay in grapefruit.

Grapes. Grapes should be firmly attached to pliable, fresh looking stems. Grapes should be plump with good colouring. Red or blue varieties are best when the colour is over the entire grape. Green grapes are best when they have a yellow–amber cast to the colour.

Grapes should not be purchased if there are withered stems, wrinkled or soft grapes or any indication of mould growth. Grapes may have seeds or be seeded.

Jackfruit. Jackfruit is ripe when the skin is neither bright nor dull and has a fresh appearance.

Jackfruit has begun to decay if there is skin discolouration and softness. It is underripe when dark green and hard.

Lemons. Lemons should have smooth, glossy skin, be firm to touch, and have a deep yellow colour. Greenish yellow lemons are partially ripe. Lemons may be refrigerated without cover.

Undesirable lemons are those with coarse, rough thick skin (little fruit inside); dull or dark colour; hard or shriveled skin (old); mould and or soft spots on the surface; or breaks in the skin.

Limes. Limes should have a glossy skin, yield slightly to thumb pressure and feel heavy for their size. Irregular spots (called scald) on the skin of fresh limes do not affect the quality of the fruit. Limes may be green or yellow in colour. Limes may be refrigerated without cover. Limes are not good if the skin is dull or dry and if it has soft spots, mould or breaks in the skin.

Melons. Melons other than water melon are mature when the (1) outer skin, veins and texture appears fresh and distinct, (2) the over all skin colour looks ripe (yellowish) and not green. (3) The stem is off and has left a smooth scar on the melon (immature melons have the stem attached or a jagged stem scar), and (4) will yield slightly to light thumb pressure at the blossom end.

These melons should have a pleasant or no aroma whichever is characteristic of the fruit. Refrigerate in a plastic bag for use within a week.

Melons should not be purchased or used if over–ripe (soft rind and fruit), heavily bruised, if there is mould growth, or if there are water soaked spots on the rind. Equally undesirable are hard under–ripe melons.

Unripe melons may be kept at room temperature 2 to 4 days then put into the refrigerator a few hours before serving.

Water melons. Water melons should have a smooth surface, a cream coloured underside, and round filled out ends. Cut melons should have firm and juicy red coloured flesh, and seeds which are dark brown or black.

Water melon is undesirable when the fruit is pale, streaked with white or has white seeds; also when either dry and mealy or watery.

Orange. Santaras (Loose Jacket)—is either deep yellow or green in colour. When either colour the fresh, mature, good flavoured loose jacket fruit has a skin that feels somewhat loose but not detached from the inner fleshy sections. The fruit feels heavy for its size. Discoloured spots do not harm the quality of fruit. These oranges should be refrigeratcd in a plastic bag or tight container and used within 3 to 4 days. Very deep yellow fruit may be over–ripe or lack juice and flavour. Deep green fruit tends to have been picked too green. Discoloured spots that are soft or mouldy or are punctured indicate that the fruit has begun to decay.

Maltas (Tight jacket oranges) should be heavy and have bright smooth and thin skin. Small skin blemishes do not alter the quality of the fruit. These oranges may be refrigerated without cover. Tight jacket oranges with rough, thick skins lack flavour and have a low juice content. Dry, dull skin is an indication of old fruit.

Soft spots, skin puncture or discoloured spots indicate decay.

Peaches. Peaches are best when soft, firm, plump, and the skin colour is yellow–green between red areas. The flesh of the peach may cling to the seed (clingstone) or it may separate readily (freestone). Refrigerate peaches uncovered and use within 5 days. Sprinkle cut peaches with lime or lemon juice to avoid discolouration.

Hard or shriveled green peaches should be avoided as well as over ripe soft discoloured, bruised or decaying peaches.

Pears. Pears should be firm but not hard. The colour may vary from pale yellow to light green to brown depending on the variety.

Immature pears have a dull appearance, weak skin near the stem and may be shriveled.

Flat or spongy spots indtcate bruised pithy and tasteless flesh which will also promote rot and mould growth.

Pineapple. Pineapple when fully ripe has golden yellow or reddish brown colour outside, the leaves can easily be pulled out of the top, and the pips or eyes are slightly separated, glossy and firm. The mature pineapple feels heavy compared to size. Immature pineapple that will not ripen has a dull yellow-green colour, pointed eyes, or a sunken and dried appearance. Signs of decay are soft spots, traces of mould, dark areas, and an unpleasant odour.

Plums and Prunes. Plums and Prunes should have firm but slightly soft feel, a neither bright nor dull appearance to the skin, and plump appearance. Plums may be green, purple, red or yellow. Prunes are purple and oval shaped. Refrigerate plums and use within 5 days.

Plums and Prunes should be avoided when there are breaks in the skin, the skin has a shiny colour or is shriveled or the fruit is hard.

Pomelo. see Grapefuit

Raspberries and Blackberries Raspberries and blackberries should be free of stems and caps, plump and tender but not watery and uniform in colour.

Berries that are mouldy and mushy are fast decaying and hard ones will not mature. Berries with large seeds are of poor quality.

Strawberries. Strawberries should have the cap attached, be firm and bright in colour, and of medium size.

Large strawberries often lack flavour. Dull coloured, shrunken berries may be either dry with age or over ripe and beginning to decay. Seedy areas indicate poor quality berries with irregular growth.

FRUIT PRESERVATION

Dried Fruit. Drying of fruit involves preparing the fruit and pre-treating as is indicated for some fruits. Grapes and prunes, for example, are dipped into a lye solution to remove wax and crack the surface of the outer covering. To preserve the colour and prevent spoilage, fruits are exposed to sulphur dioxide fumes. The fruit is then dried to reduce moisture content to 15 to 25 percent and packed in friction top tins.

In addition to general processes for dehydration there are preparations involving dehydration of fruits.

Banana fig is dried ripe bananas that have been peeled, sliced usually lengthwise, sulphured and dehydrated.

Banana Chips and Flour are made by blanching unripe bananas, cutting into crosswise slices, and drying them. The dried slices may be cooked, fried or converted into banana flour for use as cereal or to prepare toffee.

Jack fruit may be dried with or without sulphuring. The dried Jack bulbs or sections may be fried, or made into a pulp and dried as sheets or slabs.

Mango powder is made from drying unripe mangoes.

Mango toffee is made by squeezing pulp from uicy varieties, sprinkling with sugar and drying.

HOME DRYING TIMETABLE FOR FRUITS

(adapted from CFTRI table)

Fruit	Preparation	Pre-treatment	Sulphuring	Drying
Apple	Peel, core, cut into 3 mm slices	nil	15–30 mins.	50–55°C
Apricot	wash, halve, destone	nil	15–25 mins.	45–50°C
Banana	wash, peel, cut into 12 mm slices	nil	2 hrs.	55–60°C
Grape	wash	lye 10–20 seconds and wash	10–15 mins	55–60°C
Mango	wash, peel, cut into 12 mm slices	nil	2 hrs.	45–48°C
Papaya	wash, peel, cut into 6 mm slices	nil	2 hrs.	60–63°C
Peach	halve, peel pit	nil	15––20 mins	45–50°C
Pineapple	wash, punch core, cut into 6 mm slices	nil	2 hrs.	60–63°C

Fruit Juice. Fruit juice may be preserved in a variety of forms depending on the use.

Fruit juice is the natural juice pressed out of a fruit, remaining practically unaltered in its composition during preparation and preservation.

Fruit juice beverage is a fruit juice which is considerably altered in composition and may be diluted before being served. It may be concentrated, fermented, and or mixed with other fruit juices with or without preservatives being added.

Fruit juice cordial is sweetened fruit juice from which all the pulp and other suspended matter has been removed.

Fruit juice squash is strained juice containing a small quantity of fruit pulp and has sugar added for sweetening.

Jam, Jelly and Marmalade. Jam, Jelly and marmalade are eaten with bread and used in a variety of ways with deserts or snack foods. The *Indian Standards Institution* (I S : 5861–1970) has established that the *fruit content* of jams, jellies and marmalade shall by weight a minimum of 45 percent fruit, except that raspberry and strawberry jams shall have not less than 25 percent fruit by weight. When two fruits are combined, the minimum weight of each fruit shall be not less than 20 percent.

The *sweeteners* may be cane sugar, dextrose, invert sugar, liquid glucose, or sucrose. *Non-preserving* addatives may be pectin; salts of calcium, potassium, or sodium; and citric or tartaric acid. *Preservatives* that may be used are any suitable sulphite such as sulphur dioxide with maximum residual content not to exceed 40 parts per million.

The jam, jelly, or marmalade quality may be evaluated as to presence of wholesome or defective fruit, flavour, colour and texture. *Jam* is non–citrus fruit, fruit pulp or puree processed to a thick consistency by the application of heat with sugar or other sweetener and in some cases water. It may also contain the addition of pectin or other permitted addatives including preservatives.

Jelly is similar to jam except that the insoluble solids have been removed before the addition of the sweetener and the application of heat to thicken the product.

Marmalade is citrus fruit, fruit pulp, or puree processed to a thick consistency by the application of heat with sugar or other sweetener. It may also contain pectin, or other permitted addatives including preservatives.

Jelly marmalade is marmalade from which all or most of the insoluble solids have been removed during processing. Jelly marmalade also codtains thinly cut peel which should be well dispersed in the jelly.

Fresh fruit. Fresh fruits are best when tinned or frozen soon after harvesting. Fruits may be tinned without sugar in their own juice, in extracted juice, or in water. Most tinned or frozen fruits have better flavour and texture if prepared with sugar or syrup. In freezing, about 3/5 cup of syrup or other liquid should be used with each pint of fruit. A forty percent sugar to water syrup is recommended for most fruits. A lighter syrup is better for fruits with a mild flavour. A heavier syrup is needed for very sour fruits. Where a syrup is not made and sugar is added to the fruit, from 1/2 to 4/5 cup sugar is used with each litre of fruit. For improved flavour, 1000 mg, or 1/2 Standard spoon of ascorbic acid may be added to one litre of syrup for freezing, or 1/4 S (500 mg) ascorbic acid dissolved in 1/5 cup cold water may be added to each litre of fruit for packing with sugar.

Sugar syrup for freezing or tinning fruit varies with the type of fruit or the use to be made of the fruit. For most purposes the following syrups are recommended :

Fruit	Type of Syrup
Apples	thin
Apricot, cherries, grapefruit pears, prunes	medium
Berries, figs, peaches, plums	medium or heavy
Grapes, rhubarb	medium or thin
currants, gooseberry, rhubarb	syrup not required.

Concentration of Sugar Syrups:

Type of syrup	Percent of sugar	Sugar cups	Water cups	Yield cups
Heavy	50	4 3/5	4	5 1/2
Medium	40	3	4	5 1/2
Thin	30	2	4	5

Frozen Fruit. Frozen fruit resembles fresh fruit in flavour, but often the texture is altered. Tinned fruits may be processed in metal or glass containers. Both flavour and texture may be altered. Proper processing of fresh good quality fruit provides certain nourishing fruits at times when it may be out of season, or, at prices more reasonable than early and late in season. Both frozen and tinned fruit have the advantage of being available for emergency and when marketing is inconvenient.

HOME TINNING TIMETABLE FOR FRUITS

Fruit	Preheating*	Process in Boiling-Water Bath** In glass jars half litre	litre	R-10 In tins R-11 No. 2 can	No. 2½ can
Apples, pieces	Boil 5 min	15 min	20 min	10 min	10 min
Applesauce	Heat through	10	10	10	10
Apricots, halves	Heat through	20	25	25	30
Apricots, halves	Raw pack	25	30	30	35
Banana		20	20		
Berries, except strawberries	Heat to boiling	10	15	15	20
Berries, – do	Raw pack	10	15	15	20
Cherries	Heat to boiling	10	15	15	20
Cherries	Raw pack	20	25	20	25
Fig		15	20	10	15
Fruit juices	Heat to simmer	5	5	5	5
Fruit purees	Heat to simmer	10	10	10	10
Grape	Nil	15	20	12	12
Guava	—	25	30	20	20
Jackfruit	—			25	30
Litchies	—			25	30
Loquat	—			25	30
Mango	—			25	30
Mulberry	—			10	12
Papaya	—			25	30
Peach, halves	Heat through	20	25	25	30
Peach, halves	Raw pack	25	30	30	35
Pear. halves	Heat through	20	25	25	30
Pear, halves	Raw pack	25	30	30	35
Pineapple		25	30	20	30
Plum, whole, halves	Heat to boiling	20	25	15	20
Plum –do–	Raw pack	20	25	15	20
Raspberry				10	12
Rhubarb, 1 cm pieces	Heat to boiling	10	10	10	10
Strawberries	Heat to boiling	15	15	10	15
Tomatoes, quartered	Heat to boiling	15	15	10	10
Tomatoes, whole or cut	Raw pack	35	45	45	55
Tomato juice	Heat to boiling	10	10	15	15

*Preheat berries, rhubarb and tomatoes without adding liquid. Preheat other fruit in fruit juice, in water or in sugar syrup, allowing 3/5 – 4/5 cup for a half litre jar (2 C) or 1 to 1¼ cups for a litre jar.

** For altitude cookery, increase precessing time 1 minute for each 308 mtrs. (1000 ft.) above sea level if the processing time is up to 20 minutes; 2 minutes for each 308 mtrs. if processing time is stated as more than 20 minutes.

Note. *Time is counted* after the water bath begins to boil around the jars or tins.

FRESH FRUIT FREEZING CHART

Fruit	Preparation	Dry sugar pack		Syrup pack		Without sugar	
		Sugar to 1 l. fruit	Ascorbic acid to 1 l. fruit	Type of syrup	Ascorbic acid to 1 l. syrup	Yes or No	Ascorbic acid to 1 l. fruit
Apples	wash, core, pare slice into cold salt water (3 S to 1 l.). Drain Scald 2 min. Cool.	1/2 C	1/2 S	40%	1/2 S	Yes	1/2 S
Apricot	Wash, halve, pit Scald ½ min. Cool.	1/2 C	3/4 S	40%	3/4 S	No	
Avocado	Peel, pit and mash.	1 C				Yes	1/8 S
Blackberry	Remove stem, wash, drain.	3/4 C		40%		Yes	
Blueberry	Sort, wash, drain scald 1 min. Cool.			40%		Yes	
Cherry	Stem, wash, drain pit or leave whole.	3/4 C	1/4 S	50%	1/2 S	No	
Currant	Wash, Stem, drain.	3/4 C		50%		Yes	
Fig	Wash, stem, drain.			35%	3/4 S	Yes	3/4 S
Fruit coctail	Prepare each fruit.			35%	1/2 S	No	
Gooseberry	Sort, stem, wash, drain.			50%		Yes	
Grapefruit	Wash, peel, section.			40%	1/2 S	No	
Grape	Wash, stem, seed.			40%		Yes	
Mango	Wash, peel, pit, slice if wanted.	2/3 C	1/2 S	40%	1/2 S	No	
Melon	Half, seed, peel cube. ball or slice.			30%		No	
Orange	see grapefruit					Yes	
Peach	see mango					No	
Pear	Wash, peel, core, half or slice.			40%	3/4 S	No	
Pineapple	Pare, core, cut.			30%		Yes	
Plum	Wash, halve or leave whole.			40%	1/2 S	Yes	1/2 S
Raspberry	Sort, wash, drain.	3/4 C		40%		Yes	
Rhubarb	Wash, cut, scald, cool.			40%		Yes	
Roselle	see cherries						
Strawberry	Sort. wash, cap.	3/4 C		50%		Yes	

Grain Products

Cereal grains are the dehydrated fruit of grasses such as barley, corn, oats, ragi, rice and wheat. The grains are similar in structure, differing in size, shape and specific characteristics. The structural aspects of the grain or kernel are *bran* which is the outer cover, *endosperm* which is the food supply of the plant, and *germ* which has the necessary elements for new plant generation.

Whole grain cereals retain the specific nutrients that are normally in the whole unprocessed grain.

Enrichcd cereals contain added vitamins and or minerals beyond and in addition to those of the whole grain.

Restored cereals have sufficient iron, niacin, and thiamine added to replace the amounts lost in their processing.

Breakfast cereal. These cereal grains have been processed in most instances and may be flaked, granulated, powdered, puffed, rolled or shredded. Raw or partially cooked cereals may be regular, quick cooking, or instant products. Quick cooking oats have been cut into tiny particles and rolled into thin flakes. Instant cereals are partially pre-cooked and may be modified with a chemical to permit quick entry of water into the cereal.

Cereal and millets are food grains of monocotyledonous origin

Pulses are food grains obtained from legumes.

Dal or dhals are split halves of pulses with or without husk.

Cereals, Millets and Pulses

Name	Botanical Name
Cereals	
Barley	Hordeum distichon B. H. Vulgare L.
Maize	Zen mays L.
Oats	Avena byzantina K. Koch
Rice, paddy	Oryza sativa L.
Wheat	
club, dwarf, short	Triticum sphaerococcum Perc
common	Triticum aestivum L.
Durum, macaroni	Triticum durum Desf.
Emmer	Triticum dicoccum Schubler
Millets	
Barnyard (Savan)	Echinochloa frumentacea L.
Finger (ragi)	Elensine coracana Gaertn.
Foxtail (kangni)	Setaria italica Beauc.
Kcdo (Kodon)	Paspalum scrobiculatum L.
Little millet (sava)	Panicum miliare Lam.
Pearl (Bajra)	Pennisetum typdhoides
Proso (China)	Panicum miliaceum L.
Sorghum (Jawar)	Sorghum vulgare Pers.

Name	Botanical Name
Pulses	
Bengal gram, chick pea (chana)	Cicer arietinum L.
Black gram (urad)	Phaseolus mungo L.
Chickling vetch (Kesari)	Lathyrus sativus L.
Cow pea (chaula)	Vigna sinensis L.
Dew gram (moth)	Phaseolus aconitifalius Jacq.
Field bean, flat bean (val)	Dolichos Sablab L.
Green Gram (mung)	Phasealus aureus Roxh.
Horse Gram (Kulthi)	Dolichos biflorus L.
Lentil (Masur)	Lens culinaris medicus or Ervum Lens L.
Pea (Matar)	Pisum sativum L.
Red gram (tur)	cajanus cajan L.
Soya bean (bhat)	Glycine max merr.

GRAIN PRODUCTS. Wheat Flour. When flour is used in recipes it means some form of wheat flour unless otherwise specified. When unqualified the term means all purpose (white) flour or maida.

Types of Flour *Atta* (whole wheat flour) is the coarse product obtained by milling or grinding cleaned wheat so that the natural constituents of the wheat remain unaltered. Low gluten is 7–9 percent and hign gluten above 9 percent.

Instant Flour (maida) is a granular all-purpose flour which has been exposed to steam so that individual particles form into agglomerates. While this flour blends more readily with liquid, special recipes are needed to assure good quality baked products.

Maida (white flour; flour) is prepared by milling and sifting cleaned wheat. It may be bleached or unbleached and consists mainly of endosperm.

Maida with low gluten has 7–8 percent, medium gluten 8–10 percent and high gluten above 10 percent.

Self-rising flour is maida to which leavening ingredients have been added in proportion for household baking. Leavening agents are usually soda bicarbonate and monocalcium phosphate.

Cracked Wheat is cut rather than ground. It gives up little of its starch as a binder so must be mixed with maida in baking.

Classes of fiour by kind of wheat. *Durum* wheats are used for making sooji or rava (semolina), macaroni spaghetti and vermicelli.

Hard wheats are used for making atta, cracked wheat cereal, and maida for yeast bread baking. Hard wheat flours are high in protein (in excess of 10. 5%) and somewhat granular to touch.

Soft wheats are used for making pastry and cake flours and maida for quick breads. They are fairly low in protein (less than 10%) and are finely milled.

OTHER FLOURS. Where gluten is required, the following flours are usually used in combination with wheat flour because they either lack gluten – forming proteins or as in the case of rye flour produce gluten of low elasticity. Some flours are :

Bengal Gram Flour (Besan) is made by roasting cleaned Bengal Gram dhal and grinding it in a flour mill ; or by grinding into flour puffed Bengal gram dhal.

Carob flour is made by grinding the dried pods of tamarind.

Corn flour may be made by milling and sifting yellow or white corn or as a by product of preparing corn meal. It is the refined starch obtained from the endosperm of corn.

Cottonseed flour is high in protein and may be used in baking to increase protein content. Use 1/5 cottonseed flour with 4/5 maida or atta.

Mysore flour is a blend of 75% tapioca flour and 25% groundnut flour and is used as a partial substitute for cereal flours.

Peanut (Ground nut) flour may be used 1/5 with 4/5 atta or maida or tapioca flour to increase protein content.

Ragi flour is made from milling cleaned ragi.

Rice flour is a white starchy flour milled of white rice. Waxy rice flour is largely amylopectin. It acts as a stabilizer to prevent separation of sauces and gravies in frozen products.

Rye flour is obtained by sifting rye meal and is available in white, medium and dark grades. The rye flour gluten factor provides stickiness, but lacks elasticity so that in making bread, one part maida is used with 1/4 parts rye flour.

Soy flour may be : full fat which is made by grinding soy beans with the hull removed ; or low fat which is made from the soy bean 'cake' after most of or all the oil has been removed. Soy flour is highly flavoured and therefore is combined in proportions upto 1/5 cup with 4/5 cup atta or maida. Soy flour browns readily so baking temperatures may be reduced by 10°C or 25°F.

Tapioca flour (Sago) is prepared from either the roots of the casava plant or a type of palm.

3 1/4 S Tapioca flour = to thicken 1 C liquid.

1 S Tapioca flour = 2 S maida in thickening capacity.

(to cook with tapioca flour, only bring to the point of boil and remove from the heat.)

Waxy corn (Maize) or rice flour is a waxy starch made of certain varieties of corn or rice because these flours keep gravies and sauces from separating when reheated and less of a tendency to form lumps in the cooking process. These waxy flours are composed mostly of amylopectin with little or no amylose.

GRAIN AND SIMILAR NON-FLOUR PRODUCTS. DHAL PRODUCTS. Dhal flour and fresh dhal products are discussed elsewhere.

Bengal Gram, Roasted, Bengal gram is soaked or is roasted while still moist as raw grain in the husk. Seasoned with salt, roasted Bengal gram is a popular snack.

Bengal Gram Dhal, Roasted. Bengal gram dhal is moistened, roasted and dehusked or dehusked before roasting.

Papad may be plain or spiced and pulse, rice or sago based. Some varieties include such ingredients as bananas, jackfruit, shrimp and sweet potatoes.

Papad may be rolled thick or thin with a diameter range of 15.0 to 19.1 cm and weight range from 12 to 23 grams each.

Spiced or masala papads are prepared from mung or urad dhal or sometimes from Bengal gram alone or in combination with urad dhal. Spices include cummin seed, pepper and red chillies. The spice specks may be bold or fine ; their distribution may be close and uniform or sparce or irregular.

Raw papad should be flexible; free of holes; uniform in shape, size and thickness; have a uniform distribution of spices where present, and be free of fungus or insect infestation.

Cooked papad should be crisp and crunchy to bite, and have a balanced and pleasing taste as to the basic ingredient, salt and spices. The colour should be uniformly straw or cream like. The papad texture should be even and have a mealy look and feel. The aroma and after taste should be pleasant.

MAIZE OR CORN PRODUCTS. *Corn meal* is made by grinding cleaned white or yellow corn meal, retaining some or all of the germ depending on the grinding process. Bolting is a process where the cornmeal is ground somewhat fine.

Hominy is corn with the hull and germ removed. Pearl hominy has the hull removed by machinery and the grain left whole. Lye hominy is whole grain with the hull removed by soaking in a lye water. Hominy grits may be either the pearl or lye processed grain which has been broken into evenly coarse pieces.

Corn cereals are prepared from corn grits cooked and toasted in flakes or puffs. They may be flavoured and they may be enriched with vitamins and minerals.

OAT PRODUCTS. *Oats or oatmeal* is made by rolling the hulled oats so as to form flakes.

HEALTH CELL

Quick cooking oats are cut into tiny particles and rolled into thin, small flakes. Regular oats have thicker, larger flakes.

Pulse products. see Dhal products.

RAGI PRODUCTS (ALSO CHOLAM). *Malt* is made with 95% germination of either ragi or cholam. It is made by cleaning, washing, steeping, couching, drying, roasting, powdering and sieving the product.

RICE PRODUCTS. *Rice* is available in many varieties : Rice varieties fall into different types or Categories : short bold (coarse), long bold (medium), medium slender (fine), long slender (long fine), short slender (short fine), and scented slender (superfine). Parboiled rice has been processed by soaking paddy in hot water at 70°–75°C for four hours and then steaming and drying before hulling and milling. Parboiling causes migration of minerals and vitamins from the pericarp and germ to the endosperm of the grain. The process gelatinizes the starch and improves the keeping quality of rice.

Rice brand is the bran and germ with some hull as a smooth brownish powder with a slightly sweet taste.

Milled Rice is mechanically separated from the hull.

Hand pounded rice is unmilled and separated from the hull with a wooden hand husking device or by pounding.

Rice flakes are made by roasting moist new or moistened paddy and pounding it while hot so that it forms flat flakes, then removing the hull.

Puffed rice is made by roasting soaked rice in a hot pan until it puffs.

Sago Products Sago (Tapioca) is made from flour of the casava root or a type of palm and marketed in two forms :

Quick cooking is made by grinding a cooked dough.

Pearl tapioca is made by heating a mixture of tapioca flour and water on a metal surface until the pellet like balls form.

WHEAT PRODUCTS. *Bulgar* wheat is whole wheat that has been cooked, dried, partially de-branned and cracked into coarse, angular fragments. Re-hydraion requires 15–25 minutes of cooking.

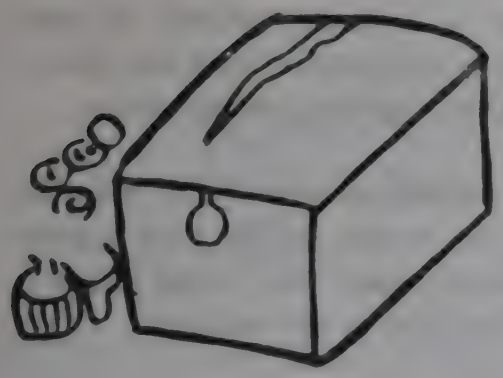
Cracked wheat is prepared by cutting cleaned wheat into coarse pieces.

Semolina (sooji or rava) is made from sifted coarse ground wheat which has the bran and most of the germ removed.

Ready to eat cereals are prepared from whole wheat or parts of grain, i. e. puffed wheat or wheat flakes. The products are pre-cooked and flavoured, then dried.

Storage and Use Cereals may be stored without spoilage for 2 to 3 months. Cornmeal for 4 to 6 months; bulgar and wild rice for 6 months; and other rice for a year.

Store cereals and flours in tightly covered containers in a dry place at room temperature.



Leavening Agents

A leavening agent is a gas formed or incorporated into a batter or dough to make it rise, increase in volume or bulk and become light and porous during the food preparation process. Texture and other characteristics of leavened products depend on the amount of leavening gas in the mixture, the rate at which the gas is formed, and when the gas is formed.

The three principal leavening gases are air, carbon dioxide and water vapour.

AIR. Air is introduced iuto ingredients by heating creaming and sifting; and into mixtures by beating and folding.

CARBON DIOXIDE. Carbon Dioxide is a leavening agent produced in a batter or dough by biological or chemical reactions. In most breads and cakes it is produced from sodium bicarbonate and sugar.

Ammonium bicarbonate is a leavening compound which volatilizes completely during the baking process, leaving no residue when baking thin products such as biscuits.

Sodium bicarbonate is combined with an acid ingredient to form carbon dioxide gas, water, and a salt of the acid ingredient. Common sources of acids for leavening are acidified or sour milk, jaggery, toddy and the acid salts and dry acids used in baking powders. The acidity of jaggery varies and the acidity of sour milk varies with degree of sourness and age. The acidity of jaggery varies and the acidiiy of sour milk varies with degree of sourness and age. The acidity of chocolate or cocoa, corn syrup and honey is insufficient for them to be used as the only source of acid. Since the reaction between baking soda and acid is immediate in a liquid form, sodium bicarbonate should be sifted with the dry ingredients. For proportions of baking soda and acid to use in place of baking powder or vise versa, see the table of equivalents.

Baking Powders are mixtures of acid salts or dry acid and baking soda with a starch or flour added to help stabilize and standardize the mixture. Baking powder should liberate at least 12 percent of available carbon dioxide. Available carbon dioxide is the amount of gas given off under ordinary conditions of baking. A liquid is added and heat is applied. Baking Powders are as follows :

Phosphate powders have either calcium acid phosphate or sodium acid pyrophosphate, or a combination of these. Phosphate baking powder may be double-acting (acting both at the time of mixing and during the heating process).

SAS-phosphate powders have sodium aluminium sulfate and calcium acid phosphate as the acid ingredients. This type is a double-acting baking powder, the acid phosphate reacting with the baking soda while the mixture is cold and the sulfate after heat is applied.

Tartrate powders have potassium acid tartrate (cream of tartar) and tartaric acid as acid ingredients

Potassium bicarbonate is substituted for sodium bicarbonate in baking powder to be used for low sodium diets.

All baking powders liberate some corbon dioxide in the mixing process and some during the heating or baking. Tartrate powders release the largest amount of carbon dioxide while the mixture is cold, phosphate powders the next largest amount, and SAS-phosphate powders the least. SAS-phosphate powders liberate the most carbon dioxide during the heating process, phosphate the next and tartrate the least.

Because of different amounts of carbon dioxide lost during mixing and because of different weights per volume of the different ingredients, optimum results in experimental cooking are obtained with use of slightly different measures for different baking powders. Recipes for home use should have the type of baking powder mentioned along with the recommended amount. Manufacturers' recommendations may be used as a guide.

Sugar is used to form carbon dioxide by action of yeast or certain bacteria. A fermentation period is required before baking in order to produce the leavening gas.

Yeast is a microscopic, one celled plant which under suitable conditions of moisture, nutrients, and temperature produces carbon dioxide from simple sugars which are derived from starch and or sugar. Yeast is available in two forms :- **active dry yeast** is that which has the yeast and filler mixture dried and then packaged in granular form, and compressed yeast....

compressed yeast is a moist mixture of yeast and starch. The yeast is in an active state and due to the moisture is perishable, requiring refrigeration.

Bacteria under suitable conditions of moisture and temperature and of certain species grow rapidly and produce gases from sugar. Salt rising bread is an example of dough leavened in this manner.

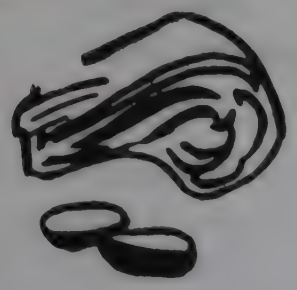
WATER VAPOUR OR STEAM is formed in any batter or dough as it is heated. It is the principal leavening agent to cream puffs, popovers, and in some iddli.

STORAGE AND USE. Store baking powder, cream of tartar and soda bicarbonate in tightly covered containers and in a dry place.

Plan to use yeast products for the date within which it is stated to be use–able.

Use the standard spoon for measuring and have it dry.

LEAVENING AGENTS



Meat

ANIMALS included in the edible mammal category are by class :

Beef : bull, cow. bullock, heifer, calf, steer and ox.

Buffalo : buffalo bull, buffalo cow, and buffalo calf.

Sheep : sheep, lamb, ewe, wether and ram.

Goat : wether, goat, she goat, buck, kid.

Swine (Pig) : barrow, boar, stag, gilt and sow.

MEAT SELECTION, STORAGE AND USE.

Inspection of Meat animals : *Ante-mortem* inspection is essential to ensure that the meat animals are free of disease or other conditions which might render the flesh unwholesome. Since some diseases are communicable from animal to man by contact, ante mortem inspection is also necessary to protect the health of the butcher.

Post-mortem inspection is essential to detect carcasses, organs and parts of carcasses which may be unfit for human consumption.

Meat inspectors are qualified veterinarians or in the absence of such a veterinarian the Medical Officer of Health or other qualified officer may be appointed by a local authority or local government to act in the place of a meat inspector.

Slaughtermen, flayers, and butchers who comply with the Indian Standards Institution's provisions are trained for their tasks, licensed, free of communicable disease, and have twice yearly medical check-ups with regular protection against diseases by vaccination and innoculation.

Meat Inspector's duties. The meat inspector is to enforce regulations and provisions for meat processing and sale. They are to keep records on number and kinds of animals slaughtered and the number and kinds of carcass, parts and organs condemned because of disease.

Meat inspectors carry out ante-mortem and post-mortem inspection of meat intended for human consumption; see that the licensed slaughter premises and implements are kept clean and disinfected; see that condemned animals, parts, and organs are destroyed; and supervise the handling and transport of meat to avoid contamination.

All meat inspected and passed as fit for human consumption is supposed to be clearly stamped, giving the date of inspection and the initials of the Meat Inspector. The stamping ink shall be of non-toxic ingredients.

Diseased conditions or other causes which render meat unwholesome or otherwise unfit for human consumption are :

-Diseased conditions caused by bacteria or by animal parasites remaining in edible parts that are pathogenic to humans, such as tuberculosis in cattle and swine.

-Anthrax in cattle, goats, sheep or swine.

-Blackleg in cattle.

-Cysticercus bonis (tape worm) (measly beef) in the flesh.

-Cysticercus cellulosae (tape worm) (measly pork) in the flesh.

-Dropsy or edema in cattle, goat, sheep or swine.

-Erasipelas in swine (acute).

-Foot and mouth disease (acute) in cattle, goat, sheep or swine.

-Goat pox.

-Jaundice.

-Rabies.

-Sheep pox.

-Swine fever.

-Tetanus

-Trichinosis in swine-trichinae is seen as numerous white specks which cause a grating or gritty sound when cut with a knife.

-Tumours in the muscles.

-Poisonous substances in the flesh. These may be post-mortem decay or poisons introduced in either the living or dead animal as a preservative.

-Conditions rendering the flesh un-nutritious such as anaemia and emaciation.

-Unsightly structural alterations.

Meat inspection indicates through an inspection stamp that the meat is supposed to be free of disease.

IS : 1982—1971.

MEAT QUALITY OR CHARACTERISTICS. The grade of meat is determined by various characteristics of the carcass. *Conformation* refers to the general build of the animal which will yield the greatest quantity of edible meat in proportion to bone and size of head. *Finish* refers to the colour, distribution, quality and quantity of fat in meat.

Marbling is even distribution of fat throughout the muscle fibre. The exterior surface of meat should have a firm, thin covering of fat such that no trimming should be required. *Quality* is indication of the palatability of meat when properly cooked. The flesh should have a bright colour and be firm, and smooth. Bone should be red and porous and fat should be white and firm.

MEAT. Meat is the lean and fatty tissues and bone of edible mammals such as cattle, goats, sheep and swine. Lean meat is about 5 percent fat, carbohydrate and minerals; 20 percent protein ; and 75 percent water.

Fatty tissue contains fat, water, and the proteins of callagen and elastin. Lean meat contains the proteins actin, myesin and tromyecin; and myoglobin, the pigment of protein.

Meat is available in both cooked and raw form. It may be fresh, dehydrated (including freeze dried), frozen or tinned.

Meat may be corned, cured, cured and dried, cured and smoked, dried, or smoked. There may also be other combinations of processing. **Corned meat** has been cured through the process of osmosis of a brine solution.

CURED, DRIED AND SMOKED MEATS. Curing of meat is done with nitrates, nitrites, salt and sugar. Nitrates and nitrites develop a red colour in lean meat while also acting as a preservative. Salt acts as a preservative. Sugar improves texture and flavour.

Meat may be cured by injecting a curing solution or dry curing by rubbing the curing agents over the meat surface. Meats may also be smoked for added flavour.

Hams. Ham is a variety of cured pork. *Cooking-before-eating hams* have been heated to an internal temperature of at least 58°C. (137°F). These hams may also be called uncooked, regular or smoked. They require to be cooked as though no partial cooking had taken place,

Fully cooked hams have been heated to an internal temperature of 65°C (148°F) and may be served as they are. However, flavour is improved if they are heated to 55°C (130°F) before serving.

Cured hams may have been processed with mild use of salts and smoking, or heavily cured with large quantities of salt or salts. The heavily cured hams require soaking or parboiling before they are baked, or cooked in liquid.

Bacon is side or belly of the pig which has been cured and some times smoked to give flavour. It is sold as a slab or sliced and may be had in full slices or bits and pieces.

Canadian bacon is cured and smoked boneless pork loin without fat.

Sausage. Sausage is seasoned minced meat, marketed as stuffed links with casings of natural or synthetic materials. Trimmings and less popular meat cuts such as head, jowls, liver, tongue, and heart from

beef, pork and veal carcasses are used in their manufacture. Some of these have been smoked while others are completely raw. They must be thoroughly cooked before eating.

Bolognas are made in larger diameters than frankfurters and pork sausages, and the bolognas are smoked sufficiently that they may be eaten without reheating.

Fermented sausages are semi-dry, dry or hard, are usually smoked, and require no further heating. Salami is one variety. Semi-dry sausages do not keep as long as fully dry sausages, such as salami, which may be kept in a cool room in winter months for more than a week.

MEAT STORAGE. *Fresh* meat should be kept loosely covered or uncovered in the refrigerator and used within a day to three days depending on the cut and condition of the as purchased meat.

Cured meats can be stored in original wrapper and used within two weeks.

Tinned hams may require refrigerated storage before opening. Check when purchasing and store as directed. Tinned hams requiring refrigeration will spoil if kept unrefrigerated.

Cooked meats should be placed in a covered dish and stored in the refrigerator or meat-safe.

Freezer storage of meat requires tight wrapping in moisture and vapour proof material and storage at -18°C (O°F) or lower.

Frozen meat may be thawed :

-keep it wrapped in the refrigerator ; thawing time varies with size and thickness of pieces.

-seal in waterproof wrapper or watertight container and immerse in cold water, allowing an hour per pound of meat.

Meat may be stored in the home :—

KIND OF MEAT	IN A FREEZER at -18°C (0°F)	REFRIGERATED 1°C-5°C (35°-37°F)
Cooked	3 months	1—2 days
Fresh		
Variety	1—2 months	1—2 days
Chops, cutlets, steaks	3—4 months	3—5 days
Ground or Minced	3 months	1—2 days
Roasts of beef, mutton	6-12 months	3—5 days
Roasts of pork, Veal	4—8 months	3—5 days
Processed and Cured		
Bacon, corned, ham	1—2 months*	1—2 weeks
Bologna, luncheon	—	3—5 days
Curried	— **	3—5 days

* Frozen cured meat loses quality rapidly.

** Spices have unpredictable quality change when frozen.

Beef and Buffalo Meat (Cattle) : *Beef carcasses* are of seven classes based mostly on age, sex. and weight :

bull is an uncastrated male bovine animal.

bullock and ox are adult castrated male bovine animals.

calf is the male or female bovine animal up to 12 months of age.

cow is a female bovine animal that has had one or more calves ; or a fully mature barren female bovine animal.

heifer is a female bovine animal that has not developed the mature form of a cow or that has not been served by a bull.

steer is a bovine male animal castrated before reaching sexual maturity.

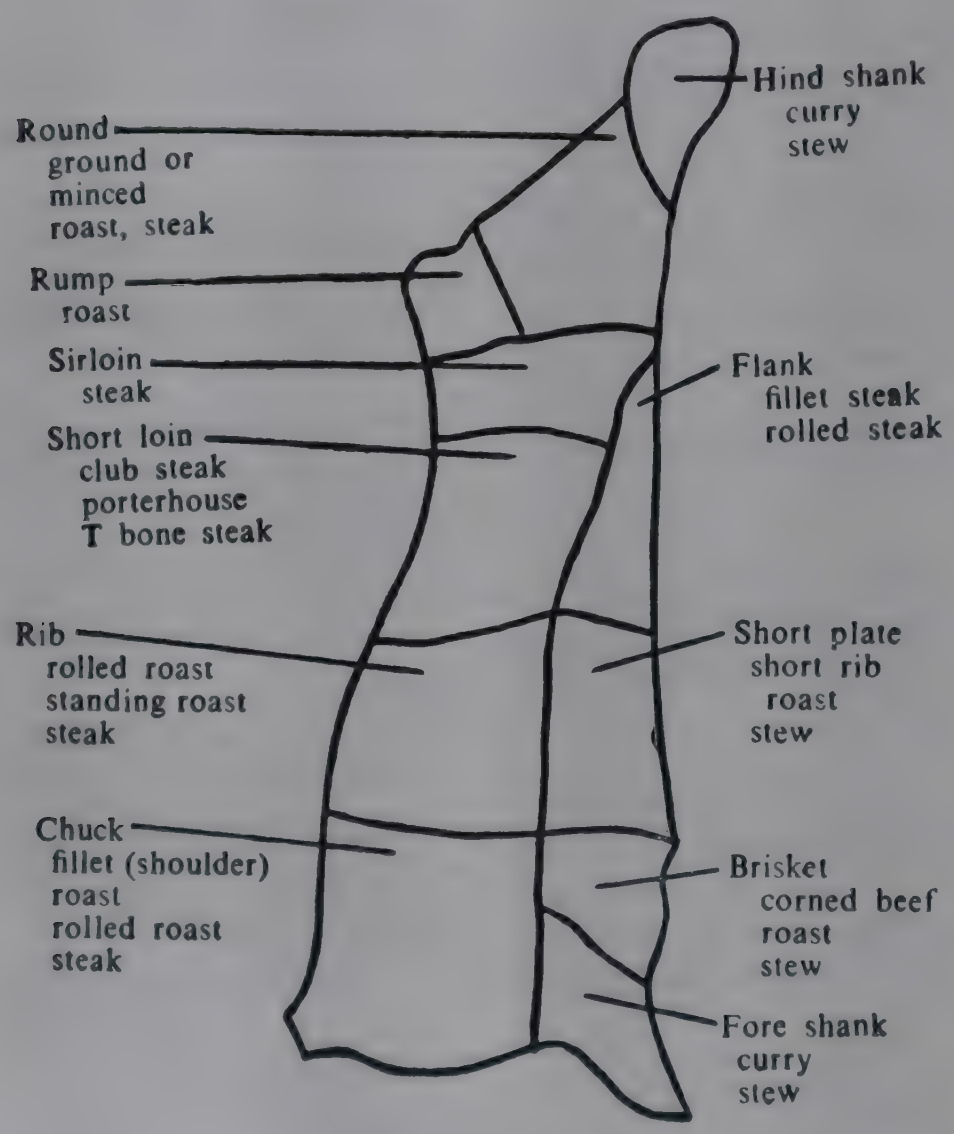
veal is meat from cattle under three months of age. Each of the above classes of beef are further classified as to conformation, finish and quality with grades of prime, choice, good, commercial. utility and cutter or canner, from highest to lowest grade.

Buffalo flesh is similar to beef except that buffalo flesh is coarser grained than beef, meat is less tender because it is not marbled with fat, the fat is white, and the percentage of dressed weight is lower than beef cattle due to the buffalo's poorly developed rump, massive head, and thick hide.

The beef chart showing beef cuts and their use is as follows:

BEEF CUTS

(Beef and buffalo cuts)



MUTTON AND GOAT MEAT : *Lamb and mutton* are classed under three main headings based largely on age. *Lamb* refers to the young *ovine* animal of both sexes up to 12 months of age. *Yearling Mutton* is from young sheep from 12 to 20 months old. *Mature Mutton* is flesh from both male and female, castrated and uncastrated ovine animals over 20 months in age when slaughtered.

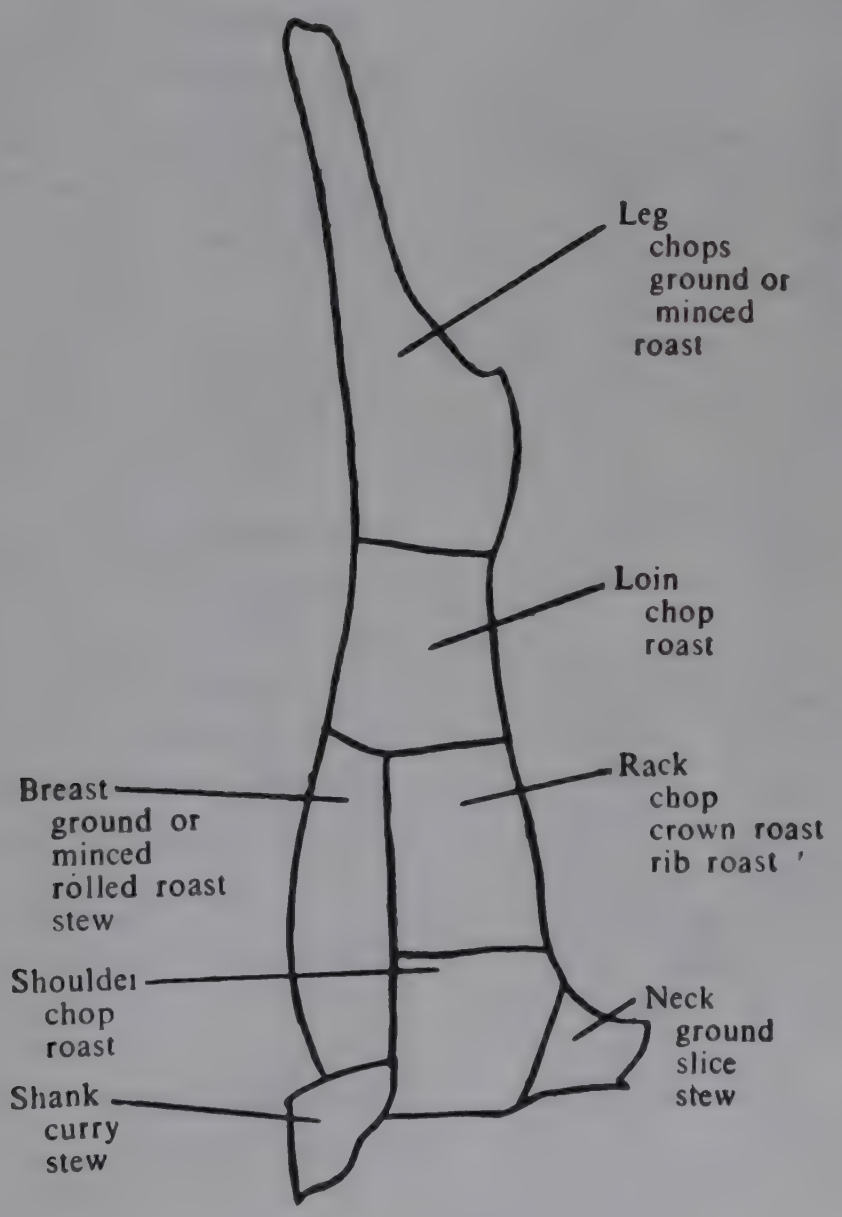
MUTTON and lamb are further divided into six grades as determined by confirmation, finish and quality, i. e.—prime, choice, good, commercial, utility and cull from highest to lowest.

GOAT flesh is similar to lamb and mutton except that it does not have the fat distribution nor yield as high a percentage of dressed meat. Older goat flesh has a quite strong flavour.

Lamb and mutton cuts and their use are as follows :

LAMB CUTS

(Goat, lamb, and mutton cuts)



MUTTON AND GOAT MEAT

Pork Meat (Swine). Pork is meat from pigs of either sex, usually under one year of age. Wholesalers sometimes classify swine as follows:—

barrows—young males.

boars—mature uncastrated males.

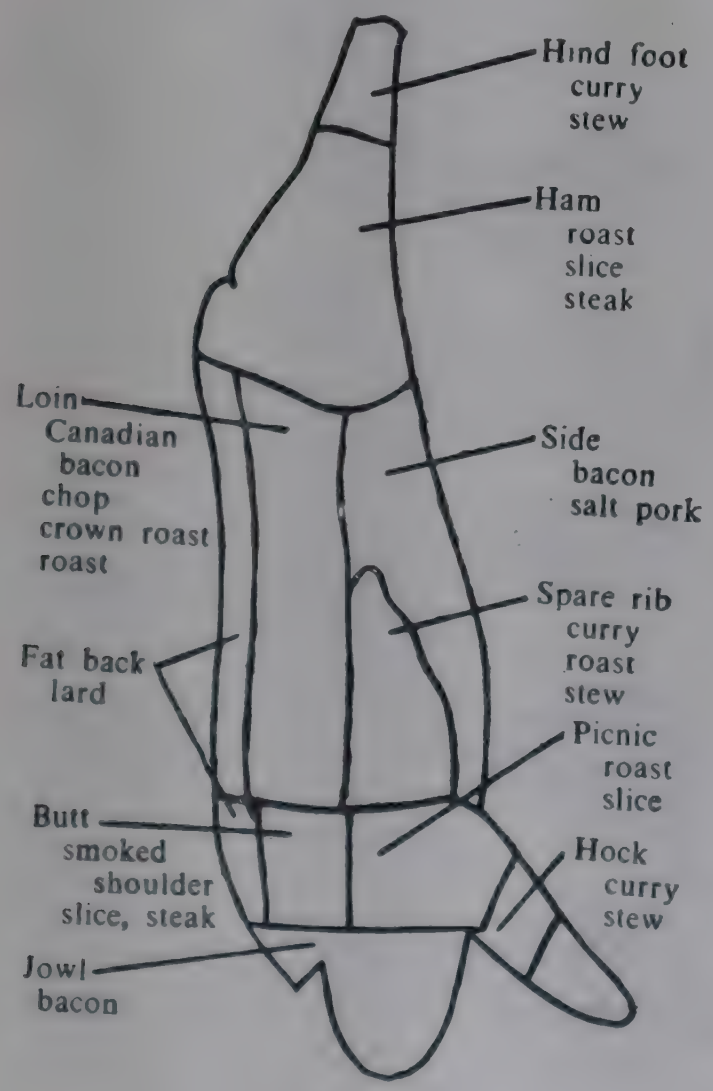
gilts—young females.

sows—females that have borne young.

stages—mature castrated males.

Pork is available fresh cured, and cured and smoked. The Pork Chart showing cuts and their use is as follows:

Pork Cuts



MEAT COOKERY

COOKING MEAT requires varying lengths of time because of the composition, cut, shape, size and weight of the meat. Timetables provide a guide to approximately that required to bring the internal temperature of the meat to doneness. Cooking times are based on that required to cook good quality meat taken directly from the refrigerator to stove.

Plan to finish cooking 20–30 minutes before needed any meat which requires cutting so that it can be carved or sliced more easily (see timetable).

To cook frozen meat – use proper thawing temperatures, cooking times, and cooking methods so as to maintain flavour and avoid meat shrinkage. Unthawed frozen meat requires from 1–1½ times as long to cook as non frozen or thawed meats.

METHODS OF COOKING MEAT. *Braize.* Season meat or roll meat in seasoned maida. Brown in small quantities of fat. Add a small amount of liquid. Cover and simmer on the top of stove or in a slow oven 163°C (325°F).

Beef cubes (3 cmsX3 cms) –2½–3 hours.

Chops, cutlets (1–2 cms. thick) –½–1 hour.

Broil. Make cuts into the fat at the edge of meat to prevent curling. Place meat on rack of the broiler pan. Follow the manufacturer's direction for operation of broiler, preheating and placement of broiler pan. Broil about half of the time indicated in the timetable. Season that side. Turn meat, broil for remainder of time. Season and serve.

The timetable for broiling is based on a temperature of approximately 177°C (350°F) at the top surface of meat. Broiling time also depends on thickness of meat, tenderness of meat, and degree of doneneness required. Thick cuts should be placed further from the heat than thin ones.

BROILING TIMETABLE

bacon	4–5 mins.
canadian bacon	10 mins.
chops	12–20 mins.
cutlet or ground meat	8–15 mins.
kabab	20 mins.
liver	12 mins.
steak	10–25 mins.

Pan broil or pan Fry. Season and dredge in crumbs, maida, or rava as desired. Using a small quantity of fat in a heavy fry pan, cook meat slowly turning occasionally until meat is tender.

Cook In Liquid. Brown or not as desired. Add sufficient liquid to cover the meat. Cover tightly and simmer, without boiling until tender.

Corned	1–1½ k g	3–4 hours.
Corned for curry, soup, stew,	2–4 c m	1½–2 hours.
Smoked	1–1½ k g	1½–2 hours.
	3–4 k gs	3–4 hours.
Tongue, heart,	1–2 k g	3–4 hours.

ROAST. Season as desired. Place the roast fat side up on a rack in a covered or uncovered pan, (the roast can be loosely wrapped in aluminium foil without puncture if the juice of the meat is to be kept around the meat, or with a few small holes in the bottom. Add no water. Roast at 163°C (325°F), slow oven, to the doneness required. No basting is necessary unless the uncovered meat appears dry. (see Timetable).

A meat thermometer may be inserted in the centre of the roast for the most accurate test of doneness. Insert the thermometer into the raw meat so that the bulb reaches the thickest area of the lean meat, and does not rest on bone or in fat. When the thermometer registers the desired temperature, push it a little further into the meat. If the temperature drops, continue cooking to the correct temperature.

Variety meats. These meats are cooked to the well done stage. All may be braised or simmered. Liver may be broiled.

TIMETABLE FOR MEATS

KIND AND CUT	WEIGHT / THICKNESS	Braising Time		Baking or Roasting at 163°C (325°F)		
		Top of stove Min. or	Pressure Cooker Hrs.	Internal Temperature		Cooking Time in Hrs.
Beef						
Pot Roast) Corned Beef)	1.5—2.5 kg	4 hrs.	3/4—1 hr.	60°C 70°C 77°C	rare medium well done	3 3 1/4 4
Round or Chuck steak	2.5— 3cm thick	2—2 1/2 hrs.	45 min.			—
Undercut	1 kg	2 hrs.	30 min.	— — —	rare medium well done	1 1/2 2 2 1/4
Cubed for stew	3 cm cubes	2 1/2—3 hrs.	30 min.	—	—	—
Tongue	1.5—2 kg	3—3 1/2 hrs.	1 hr.	—	—	—
Rib (short)	2 kg	2—2 1/2 hrs.	45 min.	60°C 70°C 77°C	rare medium well done	2 2 1/2 3
Lamb (Mutton)						
Shoulder rolled	1.5 kg	2—2 1/2 hrs.	3/4—1 hr.	82°C (180°F)	well done	2 1/2
Shoulder chops	2 cm thick	3 hrs.	3/4—1 hr.	—		—
Shank (foreleg)	1/2 kg	1 1/2—2 hrs.	30 min.	—		—
Cubed for stew	3 cm cubes	1 1/2—2 hrs.	20 min.	82°C (180°F)		—
Leg (hind)	1 1/2—2 kg	—	3/4—1 hr.			2 1/2—3
Pork						
Ham (cured)	2—4 kg	2 1/2—4 hrs.	3/4—1 hr.	70°C (160°F)		2 1/2—4
Fresh (Leg or shoulder)	2—3 kg	—		85°C (185°F)		3—4
Loin	2.5 kg	1 1/2—2 1/2 hrs.	45 min.	85°C (185°F)		3

Milk and Milk Products

Milk and Milk products are becoming more standardized with dairies and milk co–operatives throughout the country.

BUTTER. Butter is made from sour or sweet cream of buffalo or cow milk and contains not less than 80 percent milk fat. A lactic acid culture may be added to the cream before churning to develop flavour and aroma. Butter is packaged in paper, cardboard or tins in 100 grams, 500 grams or other quantities.

Ghee. Ghee is a semifluid or fluid butter made by melting buffalo or cow butter, cooling and pouring off the more liquid portion as the ghee.

CHEESE. Cheese comes in many forms and flavours. Each one has a particular purpose.

Natural Cheese is made from buffalo, cow, goat, or sheep milk or cream and is cured or aged to develop flavour. Natural cheese may be classified by consistency or texture, and by kind and degree of ripening.

Soft Cheese - unripened soft cheeses are cottage, cream and neufchatel. Limburger is a bacteria ripened soft cheese and Brie and Camembert are examples of mould ripened cheeses.

semi - soft cheese - Roquefort is mould ripened. Blue, Brick, and Muenster are bacteria ripened semi–soft cheeses.

semi - hard cheese – Colby, Edam and Gouda are bacteria ripened semi–hard cheeses.

hard cheeses - Cheddar and Swiss are bacteria ripened hard cheeses.

very hard cheeses – Parmesan and Romano are bacteria ripened very hard cheeses.

Cheese Blends. *Process cheese* is pasteurized and made by blending one or more lots of cheese with the aid of heat, water and up to 3 percent of sodium citrate.

cheese food is made with one or more varieties of cheese mixed with milk solids, salt, and up to 3 percent of an emulsifier with the aid of heat. The milk fat content is lower than regular cheese and the moisture content higher.

cheese spread may be plain or have a variety of flavours added. The moisture content is higher than cheesefood, a stabilizer is added, and the milk fat content is lower.

STORAGE AND USE: Refrigerate all cheese if possible.

Uncreamed cottage cheese may be frozen and will keep for about a month. Refrigerated cottage cheese should be used within three or four days.

Except for cottage and creamed cheese, other cheese has a better flavour and texture when served at room temperature.

Cheese should be cooked at moderate to low temperatures to prevent its becoming stringy or tough.

Thoroughiy chilled cheese grates more easily than cheese at room temperature.

CREAM. Cream is the fat portion of milk which on standing rises to the milk surface, or is separated from it by centrifugal force.

Fresh, sweet cream. *Heavy cream* contains not less than 36 percent milk fat, usually 36–40 percent. This cream whips easily.

Homogenized cream is 18–30 percent milk fat that has had the fat globules mechanically reduced in size. It usually doesn't whip.

Light cream is of two types : 30–35 percent milk fat which usually can be whipped, and 18–29 percent milk fat which may or may not be homogenized, does not whip and is used as table or coffee cream.

Half and half is a mixture of milk and cream that has 10–12 percent of milk fat and may be homogenized.

Pressurized whipped cream is a mixture of eream, sugar, stabilizers and emulcifiers which is packed under pressure. The cream whips as gas (dissolved in it and usually nitrous oxide) is released through a nozzle.

Cultured Cream. *Sour cream* has 18–20 percent of milk fat and is made by adding a lactic acid culture and allowing it to ripen.

Half and half sour cream consists of a milk and cream mixture of 10–12 percent milk fat to which a culture has been added and allowed to ripen.

Whipping of Cream. Whipped cream has a glossy, smooth and thick foam. The fat content should be 20–40%. the higher fat content making a more stable foam. Cream that has been chilled 48 hours whips more readily than fresh or older cream.

Adding 1/5 cup nonfat milk powder to each 1 cup cream before it is aged increases the stability of the whipped cream. Pasteurization decreases slightly the stability and volume of whipped cream. Homogenization greatly decreases both stability and volume.

Whipped cream freezes well especially in individual servings. When refrigerated, volume decreases significantly within an hour.

STORAGE AND USE: Cream should be refrigerated at 40.5°C Sour cream may be heated at a low temperature and stirred gently. Excess of heat or stirring may cause the cream to curdle or become thin.

Sour cream may also be added to other ingredients before heating or folded into the cooked mixture at serving time as ways to stabilize it in making sauces or gravies.

Dairy sour cream does not freeze well but some prepared dishes using it freeze satisfactorily.

MILK. Milk refers to buffalo, cow or goat's milk.

Fresh, sweet milk. *Whole fresh milk* contains, on the average 85 percent water, 5.6 percent fat, and 9 percent solids other than fat. Raw milk is in its natural state without treatment other than cooling.

Pasteurized milk is raw milk that has been held at a temperature of 63°C (145°F) for not less than 30 minutes, or 72°C (161°F) for not less than 15 seconds (or other similar high temperatures and related timing) and then quickly cooled to 05°C (40°F) or lower. There are varying regulations regarding permissible bacterial count and milk fat content.

Fortified milk contains added vitamins and occasionally minerals.

Homegenzied milk has been mechanically treated to reduce the size of the milk fat globules, stabilizing the emulsion so that the fat does not separate out as cream.

Skim milk is that from which most of the cream or fat has been removed.

Nonfat milk is skim milk containing no more than 0.1 percent of fat.

Toned milk is milk which has some groundnut milk mixed with cow or buffalo milk.

Cultured Milk. *Buttermilk* is that which remains when fat is removed from milk or cream in the process of churning, usually containing about 8.5 percent nonfat milk solids.

Sour milk is produced by the natural action of lactic acid bacteria or artificially by the addition of vinegar, or lemon or lime juice.

Curd is milk that has soured to the stage when a firm curd has been formed but not to the point of separation of whey.

Yoghurt is made by fermenting concentrated, 3 to 1 on a volume basis, whole milk with a lactic acid culture. Fruit or other flavours may be added.

Sweetened Condensed milk is the result of evaporating about half the water from whole or skim milk and the addition of sugar to about 14 percent or sufficient for preservation. It is heated and cooled, then canned. Whole condensed milk should contain not less than 8.5 percent milk fat and not less than 28 percent total milk solids.

Evaporated milk is whole milk from which about 60 percent of water has been removed under vacuum at temperatures below boiling. It is homogenized, sealed in cans and sterilized. Evaporated milk should contain not less than 7.9 percent milk fat and no less than 25.9 percent total milk solids. It may be substituted for other milks in soups and sauces.

Dry Milk. *Dry whole milk* is the result of removing water from whole milk. It contains no more than 5 percent moisture and no less than 26 percent milk fat.

Nonfat dry milk results from the removal of fat and water from milk. Nonfat dry milk has no more than 5 percent moisture and not more than 1.5 percent fat.

Dry butter milk results from the removal of water from skimmed sour milk or buttermilk.

Whipping evaporated milk. Undiluted chilled *evaporated milk* whips with a foam that is smooth, thick, and glossy though less stable than whipped cream unless supplemented with gelatin or is made acid. Evaporated milk may be made acid by adding to the undiluted whipped milk 3 S lemon juice or vinegar for each cup of milk.

Gelatin may be used to stabilize whipped evaporated milk as follows : Soften 1/2 S unflavoured gelatin in 2 S cold water and dissolve in 1 cup scalded evaporated milk. Chill and whip. Add 2/5 cup icing sugar whipping only until blended.

Whipped evaporated milk will retain its two to three times increase in volume for from 45 minutes to an hour if refrigerated.

Whipping nonfat dry milk. Nonfat powdered milk varies widely in capacity for whipping. If the powdered milk will whip, the directions are : Use 2/5 cup cold water to 3/5 cup nonfat powdered milk. Use a chilled bowl and beater. Whip until the the mixture is thick enough to stand in soft peaks. Add 3 S lemon juice and continue to whip until stiff peaks form. Beat in 1/5 cup sugar. The foam is smooth, is about triple in volume, and should remain stable several hours when kept refrigerated.

Milk Storage and Use : Fresh milk should be refrigerated at 40°F (5°C). Powdered milk is measured by spooning lightly into a dry ingredient measuring cup, heaping to the brim then leveling with the straight edge of a knife or spatula.

Powdered milk may be added to dry ingredients and the correct amount of water added unless the recipe specifically calls for reconstitution. Reconstituted powdered milk should be refrigerated until used.

FROZEN DAIRY PRODUCTS. *Ice-cream* is produced by freezing a mixture of pasteurized milk and cream, sugar, stabilizers and flavouring such as extracts, fruit, chocolate or nuts. Egg is an optional ingredient. Air is whipped into the product while freezing up to 80—100 percent by volume in commercially prepared ice cream and up to 20—30 percent when prepared in the home. Commercial ice-cream weighs about 2 kg. per gallon.

Plain ice-cream should contain not less than 10 percent of milk fat and 20 percent of total milk solids by weight. When fruit, nuts and or chocolate are added, ice-cream should contain at least 8 percent milk fat and 16 percent total milk solids.

Sherbet is prepared by freezing a mix of pasteurized milk solids, stabilizer, food acid, and water with fruit juices, fruit, and extracts as flavouring. Milk fat is 1—2 percent with total milk solids 2—5 percent.

Storage and Use : ice creams and Sherbets should be stored in closed containers at 0°F (—18°C).

Softened ice-creams and sherbets refreeze coarse in texture and lower in volume than before.

Very firmly frozen ice-creams can be shifted from the freezer to the refrigerator 10 to 15 minutes before serving time.

Miscellaneous

ADDITIVES to food are those substances not normally present in the food or not present in the quantity which is included in order that some quality of the food may be improved or incidentally as a result of contact with a substance used in its production, processing or packaging or due to environmental conditions or circumstances. Some of the incidental additives may be undesirable or even very harmful to persons depending on toxic effects and quantity. Some of these may be classified as adulteration. In general additives may be added for quality improvement.

INTENTIONAL ADDITIVES

Function	Food	Chemical
Acid, alkali, buffer	catsup, cheese, corn syrup	acetic acid, Baking powder Bicarbonate of soda Sodium hydroxide
Anti oxidant	peaches, fresh, frozen	Ascorbic acid
	cereals, crackers, meat curry puff and samosa potato chips, lard	butilated hydroxyanisole (B. H. A.)
	Margarine	Lecithin
	dried fruit, cabbage, cauliflower, ladys' finger	Sulfur dioxide
	oils, sweets	Tocopheral (V. E.)
Colour	butter, margarine	Amratto, carotene,
	baked goods, beverages. puddings, sweets.	edible (food) colour
	rice, sweets	turmeric saffron
Flavour	many foods may have one or more	aromatic chemicals, essential oils, condiments, spices
	meat, seasoning salts	monosodium glutamate

Intentional additives,—concluded

Function	Food	Chemical
Nonnutritive	dietetic foods	saccharin, calcium and sodium cyclamate
Nutrition improvement	beverages, bread, cereal, margarine; milk, rice, salt	minerals, vitamins
Oxidize or bleach		potassium bromate
Preserve	dressed poultry, milk, bread, rolls	antimycotic agents
	dried fish	calcium propionate
	maraschino cherries	sodium benzoate
	pickles, salt meat	sodium chloride
	cheese	sorbic acid
Texture	firm pickles	Alum
(anticaking binding,	commercial biscuits	Ammonium bicarbonate
emulsifying, give body, harden,	cheese, evaporated milk	dieodium orthophosphate
thicken, gel).	chocolate, margarine	mono and di-glycerides
	French dressing, Jelly	pectin
Whipping agent	pressurized can	carbon dioxide
Yeast dough conditioner	Bread	calcium lactate or phosphate

ADULTERATION of food is the addition of any substance injurious to health or life, addition to create bulk by substituting other materials or substances for part or all of the product, or addition to give a false picture of the quality of the product or the identity of the product. Government records indicate that 25–30 percent of food sampled throughout the country would have some form of adulteration.

COMMON FOOD ADULTERATION

Food	Adulterants found often
Asafoetida	grit, gum, resins, sand
Black Pepper	dried papaya seeds
Bura sugar	atta, washing soda, white powder
Butter	animal fat, starch
Cereals (rice, wheat) etc	grit, mud, soapstone
Chilli powder	brick powder, sawdust
Coffee powder	chicory, date husk, tamarind husk
Coriander powder	cow or horse dung powder, starch
Curry powder	cow dung powder, dyes, mud, starch
Ghee	vanaspati
Haldi powder	lead chromate powder
Ice Cream	cellulose, non-edible colours, starch
Maida or atta	chalk powder, starch
Milk	starch and water added, fat taken away
Mustard seeds	argemone—seeds of prickly poppy
Oils, edible	argemone oil, mineral oil
Peas, green	green dye
Salt, common	white sand
Semolina (rava)	grit, sand
sugar	dirt, rava, white sand
sweets	non-edible colour
tea dust / leaves	Black gram husk, tamarind seed powder sawdust, used tea dust

Health Aspects of Adulteration of Food. Substitution of non-food content to a substance lowers the food value received for purchased food, causing especially low income purchasers to be more undernourished.

Some of the harmful effects of food adulteration are :—

-epidemic dropsy due to adulteration of edible oil with argemone oil.

-cardiac arrest due to complications from argemone oil adulteration.

-permanent paralysis due to excessive intake of khesari dal.

-stiffness of limbs due to lead poisoning.

-potential cancer from non-permitted colours in dals or sweets.

or mineral oils mixed with edible oils.

Prevention of Food Adulteration Act of 1954 (PFA). This Act has rules, a Central Food Laboratory for analysis of food samples as well as State Government Central, and sometimes Regional, Public Health Laboratories. Rules of the State should be followed in reporting and collecting samples for suspected adulteration. Currently these involve a food inspector, witnesses and collection and processing of triplicate samples in a specified manner.

(adapted from Dr. V. Nagarajan : "Food Adulteration, A Menace To Health" in *Nutrition* 7 (5) October 1973, 2–11).

BREAD CRUMBS. *Dry bread crumbs* have minimal moisture and can be rolled fine. They are used for stuffings, buttered crumbs, and for coating food for frying and baking.

Soft Bread Crumbs are those prepared by crumbling 2 to 4 day old bread, are used for bread puddings, buttered crumbs, fondues, stuffings and timbales.

CHICORY is the dried roots of Cichorium intybus Linn. It is cleaned, dried, roasted and ground from coarse to powder form depending on the intended use.

CHOCOLATE PRODUCTS. *Chocolate* is the resulting product from grinding cocoa or cocao beans that have been roasted and shelled.

Sweet Chocolate is chocolate mixed with sugar and may also contain flavourings and added cocoa butter. It is used for dipping confections.

Semi-sweet chocolate is formed from slightly sweetened chocolate and made into pieces or squares, for either baking or use as a confection.

Cocoa is powdered chocolate from which a portion of the cocoa butter has been removed; having a fat content between 10 and 22 percent.

Breakfast cocoa is a high-fat cocoa which must contain at least 22 percent cocoa fat.

Dutch process cocoa is processed with one or more alkaline ingredients and can have 10 to 20 percent cocoa fat.

Instant cocoa is a mixture of cocoa, sugar and an emulsifier for use with a hot liquid as a beverage.

Coffee is prepared by blending or otherwise selecting green coffee beans, roasting and grinding. Flavour depends on the quality of the beans, and degree of roasting and freshness of the product.

Coffee may be *decaffeinated* by soaking green coffee with a chlorinated organic solvent.

Coffee–Chicory powder is a product prepared by mixing roasted and ground coffee and chicory. The percent of content on dry basis should be: minimum caffeine 0.6, water soluble matter of chiory 35—50, maximum insoluble ash 1.3, and total ash 3–7.5.

(IS : 3820—1966).

Coffee, soluble, is instant powder prepared by extracting pure, freshly roasted and ground coffee with water then drying it to a powder. The ISI prescribed percent content is: maximum moisture by weight 3.5, maximum ash 15, minimum caffeine 2.8.

(IS : 2791—1972)

Coffee, Roasted and Ground, is prepared by roasting and grinding dehusked pure coffee seeds to a desired size; by weight: extra fine (above 50 percent passing through a 355 micron sieve); fine (50 percent passing through a 355 micron sieve); minimum (30 percent passing through a 355 micron sieve); and coarse (5 percent passing through a 355 micron sieve). Roasted and ground coffee should have by weight value : Maximum (at time of packing) moisture content of 4 percent total ash 3—6 percent, water soluble matter 26-35 percent, minimum caffeine of 1 percent, and minimum petroleum ether extract of 8.5 percent.

(IS : 3077—1972.)

The roasting may be done to light, medium, and dark roast. Coffee is also available green or roasted and left whole.

Coconut. is available fresh and green to be used as a beverage, fresh and mature, dried as halves. dessicated plain or dessicated and dried with sugar. Coconut meat may be cut into uniform shreds or dessicated into flakes.

French dressing—see salad dressing.

FRUIT PECTIN is a substance of fruit which in the correct proportion with sugar and acid, forms a jelly. Pectin is prepared from citrus fruits and apples, then either dried to powder form or held as liquid. Grapes also contain pectin of jellying quality.

GELATIN PRODUCTS. *Gelatin* is obtained from collagen in bones and good-grade skin stock by hydrolysis. In processing, gelatin may be acid or alkaline extracted. It is available in granulated, flaked, and sheet forms, the most common being granulated.

Jelly crystals is a mixture of plain gelatin, sugar, fruit acids, flavours and colouring. It is sold in packages standardized to use one half litre of liquid.

Mayonnaise—see salad dressing.

OLIVES. Olives are the edible fruit of the olive tree and are available in jars or tins as green brined, green fermented, or ripe olives or as oil. Both green and ripe olives are treated to remove the otherwise bitter taste.

Ripe olives are packed in brine with or without seeds and or spices. Green olives are fermented and packed in brine, either whole, pitted, or pitted and stuffed with pimento.

Olives vary in size, quality and freedom from blemish.

SALAD DRESSING may be of a variety of types with some most common ones described below :

Mayonnaise is an oil in water emulsion which is stabilized with egg. Mayonnaise contains about 65 percent of vegetable oil, lemon juice or vinegar, egg or egg yolk and spices.

Salad dressing has about 30 percent of vegetable oil and the addition of maida or corn flour as a thickening agent,

French dressing has 35 percent of vegetable oil with spices, vinegar, sugar and tomato puree.

Low calorie dressings have very little oil and may be artificially sweetened.

SALT (Sodium Chloride) is used to preserve and season food. Salt may have a form of iodine added, or be combined with other seasonings such as celery, garlic or onion salt.

Solubility of Salt

Temperature of Saturated Solution		% of salt in saturated solution	Dissolved by 100 g water (2/5 C)
°C	°F	g	g
–20	–4	23.6	30.9
20	68	26.4	36.0
100	212	28.2	39.8

TAMARIND – see Fruit.

TEA is prepared from leaves of the shrub thea sinersis.

Black Tea is tea which has been withered, fermented, then fired. After these processes, sorting and in some cases blending, the following grades are produced:

leaf tea has 7 grades and combinations of grades from "Tippy Golden Flowery Orange Pekoe" to "Pekoe".

broken tea has 13 grades and combinations of grades from "Tippy Golden Flowery Broken Orange Pekoe" to "Broken Pekoe".

fannings tea has 10 grades and combinations of grades from "Tippy Golden Orange fannings" to "Broken Mixed Fannings". In fannings and dust tea the green leaf is cut and cross cut into small pieces, then fermented and fired.

dust tea has six grades and combination of grades from "Broken Orange Pekoe Dust" to "Red Dust".

Green Tea has not been withered or fermented but has been subjected to steam, or heated in open pans to make the green leaves limp, then rolled and fired. Green tea has the following grades of which there may also be combinations: Hyson, Fine Hyson, Young Hyson, Fine Young Hyson, Dust, Gun Powder, and Soumee. (IS : 4541–1968).

Oolong Tea has partially fermented leaves. *Tea leaves* may be mixed with gardenia, jasmine, mint, orange or spices or a combination of these ingredients.

Tins and Glass Jars. Round tins have been standardized for general purposes.

Each type of tin is designated with a class indicating usage :

CLASS	INSIDE TREATMENT	USAGE	
		CRITERIA	EXAMPLES
A	plain inner surface, soldered end and side seam	Very low viscosity, low flash point, not compatible with or needing rubber lining.	Kerosene, lighter fluid.
	plain and non-toxic inner surface and seam treatment		Such fruit and vegetables as beans, brussel sprouts, carrots, cauliflower, cabbage, peas, all greens, turnip, grape, mango, papaya, pear, pineapple.
	non-toxic lacquered inner surface		beets, mango-pulp, pumpkin
	rubber lined lids		loquat.
B	compound lined end seam, soldered side seam		edible oils
C	dry end and side seams	non-hygroscopic products	confectionery, powdered products,
D	compound lined ends cemented side seams		edible oils
E	compound lined ends welded side seams		edible oils

ADAPTED FROM IS : 2134—1972 and CFTRI Food Preservation booklet.

ROUND TIN CAPACITY AND DIMENSIONS

Tin Ref. No.	Overseam Diameter mm.	Height mm.	Approximate Capacity ml.
R — 1	234	260	10500 — 10800
R — 2	178	203	4725 — 4840
R — 3	178	197	4510 — 4680
R — 4	142	163	2352 — 2410
R — 5	142	154	2205 — 2255
R — 6	109	146	1176 — 1260
R — 7	109	143	1150 — 1235
R — 8	109	132	1180 — 1145
R — 9	87	121	610 — 650
R — 10	87	114	588 — 630
R — 11	87	110	550 — 600
R — 12	77	70	260 — 275
R — 13	77	60	220 — 240
R — 14	63	48	110 — 125
R — 15	55	36	60 — 70

(IS : 2134—1972)

Glass Jars and bottles are used to preserve chutneys, fruit cordial, squash, syrups, ketchups and plain vinegar pickles.

Glass jars or glazed earthenware jars are used for oil pickles, oil and vinegar pickles and preserves. The glazed earthenware jars are useful for these products that are to be consumed within a few weeks.

VINEGAR. Vinegars range in acidity between 4 and 6 percent (40–60 grain).

Cider vinegar is made by alcoholic and acetuous fermentations of apple juice.

Malt vinegar is made by alcoholic and acetuous fermentations of an infusion of barley malt or other cereal malt.

Spirit vinegar (distilled or grain) is made by the acetuous fermentation of dilute distilled alcohol.

Wine vinegar is made by alcoholic and acetuous fermentations of grape juice.

Vinegar can be chemically produced by mixing a 4 to 6 percent solution of glacial ascetic acid with water.

Poultry and Related Game

Poultry includes all the domesticated birds that are used for food such as chicken, ducks, geese, guineas, pigeons, and turkeys. Poultry related game includes wild birds such as ducks, geese, jungle fowl, patridge and quail. The flesh of game except for patridge and quail, is dark in colour and has a fairly strong flavour.

Poultry may be purchased in a variety of forms. Live and dressed birds are marketed. Dressed poultry may be whole or in parts and they may be fresh, chilled, frozen, dried, and freeze dried. Prepared poultry is also available in tins.

Poultry may be inspected for wholesomeness and they may also be classified according to age, sex and weight. Standards and grades for chickens, ducks, geese, guineas, pigeons, and turkeys are in process of being or have been established by the Indian Standards Institution.

COOKING METHODS. Poultry may be braised, fried, roasted or stewed, either as a whole bird or cut into pieces. Some curry recipes call for cutting the pieces in such a way that maximum bone marrow is exposed, allowing the marrow to add flavour.

Differences in individual poultry may necessitate time adjustment from those provided in timetables and recipes. Signs of doneness are the easy movements of leg joints and softness of the flesh on drumstick and thigh. When using a thermometer with the bulb in the centre of the inner thigh muscle, it should register 85°C (185°F) when done and the centre of the stuffing or the inside of the body should register not less than 74°C (165°F) when done.

Poultry which is to be carved before serving should have the cooking completed twenty minutes before needed so that carving is more easily done.

POULTRY COOKING TIMETABLE

Kind of Poultry	Dressed Weight	Broil	Deep Fat Fry	Top of stove or pan fry	Pressure Cooker	Roast-Bake at 163°C
Chicken						
Fryer	½–1 kg	35—55 min	10—20 min	30—45 min	18—24 min	1 —2 hr.
roast-stew	1–2 kg	—	—	1½—2½ hr	30—40 min	2 —3 hr.
roast, stuffed	1–2 kg	—	—	—	—	2 —4 hr.
tandoori	½–1½ kg	35—50 min	—	1 —2 hr	—	½—1½ hr.
Duck, young	1–3 kg	50—75 min	20—30 min	1 —2 min	20—45 min	1½—4 hr.
Turkey, young	3–4 kg	—	—	—	—	3—4 hr.
full grown	4–6 kg	—	—	—	—	3—5 hr.

POULTRY SELECTION, STORAGE AND USE. Poultry should be plump with smooth, soft legs and feet and smooth, moist skin. The lower end of the breastbone should be flexible. Live poultry should have bright eyes, red comb and an abundance of pin feathers.

Freeze–dried poultry is slightly less than half the original weight.

Cooked or uncooked poultry should be loosly wrapped for refrigerator storage and used or frozen within two days.

Poultry should be frozen without any stuffing. Giblets should be used within 3 months. Cooked poultry of all kinds of and uncooked duck and goose should be used within 6 months. Uncooked chicken and turkey should be consumed or cooked and refrozen within a year. Allow 1 hour thawing time per 500 grams of poultry.

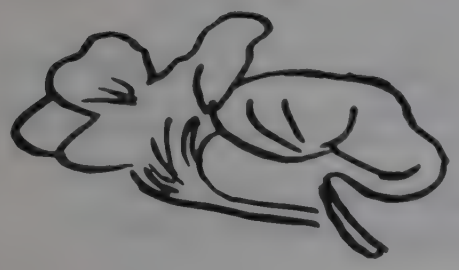
The amount of bone in proportion to meat in all poultry is relatively high. Duck contains a high amount of fat so that 1/3 more duck is purchased than chicken in order to yield the same amount of meat. Turkeys contain a higher proportion of meat to bone compared to chicken and duck. Turkeys weighing 8 kg. or more provide a higher proportion of meat to bone than smaller turkeys. Roasting chickens 2 kg or larger provide the best ratio of meat.

Poultry should be stored in refrigerated temperatures just above freezing 2°C (36°F). Careful washing of the inner cavity of poultry is important before storage as this area is subject to quick spoilage.

Poultry should be wiped dry with a clean cloth before storage.

Fish fed ducks may be blanched to reduce the fish flavour. This is done by placing the duck in a large quantity of cold water and bringing it slowly to a boil and slowly simmering for 10 minutes. Lift the duck from the boiling water and plunge quickly into cold water to firm the meat and stop the cooking. Then the recipe desired may be followed.

Wild fowl or game is lean and often legs are tough and full of tendons. The tendons may be removed and the meat marinated and cooked slowly to doneness or the legs, wings, necks and giblets may be cooked separately to provide the stock for gravy.



Spices and Condiments

Spices and Condiments, as defined by the Indian Standards Institution, apply to natural vegetable products in whole or ground form used to impart aroma and flavour to food. Another definition of condiment is any product used to enhance the flavour of food. Listed below are vegetable products used as spices and condiments and a few fruits used as condiments, the non-spice condiments being starred.

Arilus — Mace

Bark — Cassia, chinese, cinnamon

Bean — Vanilla

Berry — Allspice, pepper

Bulb — Garlic, onion,

Flower bud or young berry — clove, marigold*. nasturtium*,

Flower stigma — saffron

Fruit — cayenne pepper, chilli, kokum*, mango,* paprika, tamarind,*

Seed — Anise, Bishop's weed (lovage), caraway, cardamom, celery, coriander, cummin, dill, fennel, fenugreek, mustard, nasturtium*, nutmeg, parsley, pomegranate, poppy,

Leaf, stem — basil, bay, cassia, celery, chive, coriander, curry leaf, dill weed, fennel, geranium*, marigold*, mint, marjoram, nasturtium*, oregano, parsley, rosemary, sage, savory, tamarind*, tarragon, thyme.

Rhizome, root — asafoetida, ginger, horse-radish, parsley, turmeric.

Botanical Name and Use of Spices and Condiments.

Name	Botanical	Uses
Allspice	Pimenta dioica	Beef, fish, mutton, pork, cakes, dessert, pickles, apples, jam and jelly
Anise	Pimpinella anisum L.	Beverages, breads, cakes, supari, sweet pickles, sweets,
Asafoetida	Ferula assafoetida L.	Curry, meat.
Basil	Ocimum basilicum and O. Suave	Mutton, eggs, cheese, green beans, peas, brinjal, tomato.
Bay Leaf	European laurel	Beef, fish, pork, mutton, tomato, onion rice, green beans, carrot, beetroots, potatoes, pickles.
Bishop's Weed, lovage	carum copticum L. Beath. and Hook.	Beef, chicken, cheese, eggs, fish, lentil, mutton, as a sweet, pickles, salads.
Caraway	carum carvi L.	Beef, cheese, egg, fish, vegetable salads bread, cooked cabbage, turnip, asparagus.

Botanical Name and Use of Spices and Condiments — *contd.*

Name	Botanical	Uses
Cardamom	Elettaria cardamomum L. maton	Beef, chicken, mutton, pork, beverages, breads, cakes, desserts, barbecue, pickles, sauces, sweets.
Cardamom amomum	Amomum subulatum Roxb.	
Celery Leaf	Apium graveolcus L.	Beef, chicken, cheese, egg, fish, mutton, lentils.
Celery seed		Fish, pickles, salads, vegetables, breads, cheese, eggs.
Chervil	Anthricus cerefolium	Beef, Chicken, eggs, salads, spinach.
Chilli —	see Pepper, red	
Cinnamon bark, bud,	Cinnamomum zeylanicum Nees.	Beef, chicken, mutton, pork, breads, cakes, desserts, fruit, pickles.
cassia, chinese bark, bud, cassia, Indian leaf	Cinnamomum Cassia Blume. cinnamomum tamale (Buck. and Ham.) nees and Eberm.	
Clove	Eugenia caryophyllata Thunb	Beef, chicken, mutton, curries, fruit, chutneys, pickles, marinades, sweets, dessert, cake, jam and jelly.
Coriander leaf Coriander seed	Coriandrum sativum L.	Beef, chicken, cheese, egg, fish, mutton, pork, lentils, curries, cake, fruit, breads, baked goods. sweets.
Cummin	Cuminum cyminum L.	Beef, chicken, cheese, egg, fish, mutton, pork, lentils, curries.
black	Nigella sativa L.	
Curry Leaf	Murraya Koenigii Kurg.	Beef, chicken, fish, mutton, pork, lentil, curries.
Dill seed Dill weed	anethum graveolens L.	Beef, chicken, fish, mutton, lentil, cucumber, cabbage, potato, salads. bread, pickles, sauces.
Fennel	Foeniculum Vulgare Mill	Fish, pork, lentils, rice, potatoes, tomato, sauce for fish.
Fenugreek	Trigonella foenum graecum L.	Base for artificial maple flavour, beverage, curries, African dishes.
Garlic	Allium sativum L.	Breads, meats, vegetables, salads, curries, pickles, rice, sauces.
Geranium	Geraniaceae	Cakes, desserts, fruit.

Botanical Name and Use of Spices and Condiments — *contd.*

Name	Botanical	Uses
Ginger	Zingiber afficinale Rose	Beef, chicken, mutton, cake, fruit, marinades, curries.
Kokum	Garcinia indica choisy	Curry, juice, dessert,
Mace	Myristica fragrans Houtt.	beef, chicken, fish, baked products, desserts, fruit, pickles, sweets,
Mango dried slices powder	Mangifera indica L.	Curry, desserts.
Marigold (flower of calendula and the green part of the sweet scented variety).	Genus Tagetes	
	flower heads —	flavour in soups and stews.
	buds —	in meats, pickles and sauces.
	sweet-scented —	in pickles, salads, sauces, soups.
	dry centre —	as oil, yellow food colour.
Marjoram	geneia Origanum and Majorana	all meats, vegetables cheese, eggs, lentils.
Mint	Mentha arvensis L.	Cheese, mutton, beverages, desserts, fruit, vegetables, salads.
Mustard	Brassica alba L. Boiss Brassica juncea L. Cors. and Czern Brassica nigra L. Koch.	All meats, lentils, vegetables, salads, cheese pickles, curries.
Nasturtium	Tropalolum	Salads, pickle.
Nutmeg	myristica fragrans Houtt.	Beef, eggs, spinach, baked products, beverages, curries, fruit, rice, sauces and soups.
Onion	Allium cepa L.	curries, meats, vegetables salads, breads.
Oregano	Oreganum Vulgare	Eggs, cheese, all meats, beans, cabbage. tomato, salads.
Parsley leaf Parsley seed	Petroselinum hortense Hoffm,	Cheese, eggs, meats, vegetables, salads, curries, pickles.
Paprika	C tetragonna	All meats, cheese. eggs, fruit, vegetables, salads.

Botanical Names and Uses of Spices and Condiments — *contd.*

Name	Botanical Name	Uses
Pepper, black white cayenne red, chilli,	Piper nigrum L. cayan, modif. of Tupikyinha capsicum frutescens L.	Cheese, eggs, all meats, vegetables, salads, curries lentils, pickles, sauces
Pomegranate	Punica granatum L.	Garnish, in cheese, salad, dressing.
Poppy seed	papaver somniferum L.	baked products, fruit, rice, oil for margarine and salads.
Rose	Rosaceae	beverage, dessert, jam.
Rosemary	Rosmarlnus Officinalis	All meats, cheese, egg, lentils, marinades, peas, spinach, tomatoes.
Saffron	crocus sotinus L.	beef, chicken, fish, mutton, baked products, desserts, pilau, rice.
Savory	S. hortensis	All meats, cheese, eggs, lentils, green beans, salads, potatoes, tomatoes.
Sesame seed	Sesamium indicum, of the family Pedaliaceae	Breads, vegetables, lentils, salads sweets.
Sage	Salvia officinalis	Eggs, cheese, chicken, pork, brussel sprouts, onions, peas, tomato.
Tamarind	Tamarindus indica L.	Leaves in curry, curry, all meats, beverages, fruits, cakes. dessert, rice.
Tarragon	artemisia drocunculus	Cheese, eggs, beef, chicken, fish, mutton. pickles, salads, marinades sauces, soups and vinegar.
Thyme	T. Vulgaris	Cheese, eggs, beef, chicken, fish, mutton, beverages.
Turmeric	curcuma longa L.	Eggs, cheese, all meats, vegetables, lentils, salads, pickles.
Vanilla	Vanilla planifolia Andr.	Fruits, cakes, desserts, beverages.

SPICES AND CONDIMENTS USED WITH BREADS, CAKES, DESSERTS AND FRUIT

Bread / rolls	cake / biscuits	dessert / fruit
	allspice	allspice
anise	anise	anise
caraway	caraway	
cardamom	cardamom	cardamom
celery seed		
cinnamom	cinnamom	cinnamom
clove	clove	clove
coriander seed	coriander seed	coriander seed
cummin		
dill seed		
fennel		fennel
garlic		
	geranium	geranium
	ginger	ginger
		kokum
mace	mace	mace
		mango powder
		mint
nutmeg	nutmeg	nutmeg
onion		
poppy	poppy seed	poppy seed
rosemary		
saffron	saffron	saffron
	tamarind	tamarind
sesame seed	vanilla	vanilla

SPICES AND CONDIMENTS USED WITH CHEESE, EGGS, LENTILS, AND ANIMAL PRODUCTS

Cheese / eggs	Lentils	Animal products
	allspice	allspice
basil	basil	basil
		bay leaf
Bishop's weed	Bishop's weed	Bishop's weed
caraway		caraway
		cardamom
celery leaf, seed	celery leaf, seed	celery leaf, seed
		chervil
chervil		chilli
chilli	chilli	cinnamom
		clove
coriander leaf, seed	coriander leaf, seed	coriander leaf, seed
cummin	cummin	cummin
curry leaf	curry leaf	curry leaf
dill	dill	dill
	fennel	fennel
	fenugreek	fenugreek
garlic	garlic	garlic
		ginger
marjoram	marjoram	marjoram
		mango, powder
		mango, dry slices
		mint
mustard	mustard	mustard
		nutmeg
onion	onion	onion
oregano		oregano
Parsley leaf, seed	parsley leaf, seed	parsley leaf, seed
pepper	pepper	pepper
pomegranate		
		saffron
sago		sago
	sesame seed	
tarragon		tamarind
		tarragon
thyme		thyme
urmeric	turmeric	turmeric

SPICES AND CONDIMENTS USED WITH VEGETABLES

NOTE : celery seed, curry powder. parsley or pepper may be used with all vegetables.

Vegetable	Spices and Condiments used
asparagus	allspice, caraway seed, mace, mustard sesame seed, or tarragon.
Beans, green	Basil, bay leaf, clove, dill, ginger, marjoram, mint, mustard seed, nutmeg, oregano, savory, sesame seed, tarragon or thyme.
beetroot	allspice, bay leaf, caraway seed, clove, dill, ginger. mace, mustard seed, savory or thyme.
brinjal	Basil, coriander, cummin, fenugreek, ginger, mango powder, mustard seed or marjoram,
brussel sprouts	basil, caraway, dill, mustard seed, sage or thyme.
cabbage	caraway, dill, ginger, mint, mustard seed. nutmeg, savory or tarragon.
carrots	allspice, bay leaf, caraway, dill, fennel, ginger, mace, marjoram, mint, nutmeg or thyme.
cauliflower	caraway, dill, mace or tarragon.
cucumber	basil, dill, mint or tarragon.
onion	bay leaf, caraway, dill, ginger, mustard seed, nutmeg, oregano, sage, or thyme.
peas	basil, dill, cardamom, majoram, mint, oregano, poppy seed, rosemary, sage, savory or thyme.
potato	basil, bay leaf, caraway, chives, dill, ginger, mustard seed, nutmeg, oregano poppy seed or thyme.
pumpkin	see carrot
spinach	basil, mace. marjoram, nutmeg, or oregano.
sweet potato	allspice, cardamom, cinnamon, cloves, ginger, or nutmeg.
tomato	allspice, basil, bay leaf, cummin, oregano, sago, sesame seed, tarragon or thyme.
turnips	allspice, mustard seed.

SPICE BLENDS OR COMBINATIONS OF INTERNATIONAL COOKERY

Apple Pie Spice : combination of allspice. cardamom, cinnamon, and nutmeg.

Barbecue Seasoning : blend of allspice, black pepper, carway seed, celery, chilli, clove, coriander' cummin, garlic, mustard, nutmeg, onion, oregano, sage and salt.

Chilli Powder : blend of black pepper, caraway seed, cayenne, chilli, pepper, cummin, garlic, onion and oregano.

Crab or Shrimp Seasoning: mixture of allspice, bay leaf, black pepper, clove, chilli, savory, and yellow mustard.

Curry Powder : blend of black pepper, clove, coriander, cummin, fenugreek, garlic, ginger, mustard, red pepper and turmeric.

Herb Seasoning : blend of basil, celery seed, marjoram, oregano, parsley, tarragon and thyme.

Italian Seasoning : combination of basil, marjoram, oregano, rosemary, sage, savory and thyme.

Pickeling Spice: combination of allspice, bay leaf, black pepper, cardamom, cassia, chilli, clove, dill seed, fennelseed, ginger, mace, mustard seed and turmeric.

Poultry Seasoning: blend of allspice, black pepper, coriander, marjoram, rosemary, sage, savory and thyme.

Pumpkin Pie Spice : combination of allspice, cinnamon, ginger and nutmeg.

Sugars, Syrups and Sugar Substitutes

SUGARS. The term sugar refers to refined sucrose derived from sugar cane or sugar beets. Unless qualified, in recipes sugar refers to granulated beet or cane sugar. Sugar provides energy, adds flavour, modifies or intensifies the flavour and or texture of other foods and acts as a food preservative.

White Sugar. *Granulated Sugar* is the standard product of refined sucrose usually from sugar cane in India. Granulated sugar may be coarse, fine or super fine, the fine varieties designed for use in cakes, beverages, and similar circumstances where rapid dissolving is desired. Very large crystals are used as an adjunct in sweets such as ladu.

Icing Sugar. is granulated sugar ground to a fine powder with usually a small quantity of cornflour to prevent hardening. It is used for icings (frosting) or dusting cakes and pastry

Special forms of sugar. *Brown Sugar* is produced from the syrup remaining after the removal of commercially extractable white sugar or by addition of refined syrups to specially graded white sugar crystals. It contains varying quantities of molasses, non–sugars (ash) naturally present in molasses, and moisture. The colour may be a range from very light brown to very dark brown.

Cut tablets or cubes are made from sugar which is moulded into slabs and afterward cut into cubes or tablets of various sizes and shapes and packed into cartons of 1/2 to 2 kg.

Jaggery (gul or gur) is made by boiling the juice extracted from sugar cane or beets or palmayra juice and solidified into balls, slabs, or large lumps of varying sizes.

Other Sugars. *Corn (Maize) sugar* is crystallized dextrose (glucose) obtained by hydrolizing corn flour with an acid.

Raw sugar is unrefined crystalline sugar. The crystals are coarse, dark and sticky, containing the molasses portion of the sugar.

SYRUPS. From sugar cane. *Cane syrup* is the concentratedsap of sugar cane made by evaporation of sugar juice or by solution of sugar cane concentrate. cane Ash content of unsulfured syrup should be 4.5 percent; of the sulfured, 6 percent.

Molasses is the mother liquor or liquid which remains when raw cane sugar has crystallized.

Table molasses is dark in colour and has a low ash content.

Cooking molasses is dark in colour and has a high ash content as compared to table molasses.

Refiners' syrup is obtained in the process of refining raw cane or beet sugar which has been subjected to clarification and decolourization. It is a solution and suspension of sucrose and partially inverted sucrose, containing up to 28 percent of moisture. It is used for flavouring corn syrup.

Maize or Corn syrup is obtained by partially hydrolysing cornflour by using a catalyst acid, alkals or enzyme or a combination of these. This liquid is clarified, neutralized, and concentrated to syrup consistency. The ingredients are largely dextrose, dextrine and maltose. Two types are commonly marketed: *Light corn syrup* has been also decolourized, has a very clear consistency; and *Dark corn syrup* is a mixture of corn syrup and refiners' syrup, having a somewhat dark colour and distinctive flavour.

Honey is the nectar of plants which has been gathered, modified, stored and concentrated by honey bees. The water content should be that which is natural to the honey and usually no more than 20 percent. Its principal ingredients are fructose (levulose) and glucose

(dextrose). The different flavours of honey are classified according to the plant source from which the nectar is derived.

NON SUGAR SWEETENERS Sugar substitutes are composed of calcium and sodium salts of cyclamate, cyclamate and saccharin, or saccharin only. When these are no calorie sweeteners they are in tablet form or dissolved in water. Low calorie sweeteners are these same substances combined with dextrin, lactose, or other bulking ingredients. Sugar provides a sweetening taste, alters the density or viscosity of solutions and adds bulk. Sugar substitutes provide only the sweetening sensation. Twelve grains of saccharin is equivalent in sweetness to one cup of sugar.

SELECTION STORAGE AND USE. Sugars and syrups are available in varied qualities and forms. The standard of cleanliness and presence or absence of extraneous matter vary both in production and in marketing. Look for the particular products for the intended use—avoid dirt, vermin infested or fly contaminated products.

Store white sugar covered in a dry and ant-free place. *Measure* by placing in cup or spoon and using the straight edge of a knife to remove the excess.

Store brown sugar and jaggery in air tight containers. If the brown sugar or jaggery has too much moisture, it may be heated slightly to prevent melting or mould formation. *Measure* by packing firmly into the cup or spoon.

Store opened containers of honey and syrups in the refrigerator to avoid mould. Should small crystals form, place the container in hot water to dissolve them. Large crystals can be dissolved, by heating the honey or syrup over direct low heat adding one or more spoons of water so that by the time the crystals have dissolved the honey or syrup will be of the original density.

Medical advice should be sought before making use of the sugar substitutes especially if they are used in quantity or used for a person with a health problem.

SOLUBILITY OF SUGARS

Sugar	Temperature of saturated solution		% of sugar in saturated solution	Dissolved by 100 grams water (2/5C)	Dissolved by 1 cup water. (1 cup fine sugar = 200 grams)	
	°C	°F	grams	grams	kg	cups
COMMON SUGARS (Approximately) 20°C)						
Dextrose.....	20	68	49.7	83.1	0.18	1.4
Lactose.....	25	77	17.8	21.7	0.05	0.4
Levulose.....	20	68	78.9	375.0	0.90	
Maltose.....	21	70	44.1	78.9	0.18	1.7
Sucrose.....	20	68	67.1	203.9	0.49	2.4
SUCROSE (0 to 100°C)	0	32	64.2	179.2	0.40	2.1
	20	68	67,1	203.9	0.49	2.4
	40	104	70.4	238.1	0.54	2.8
	60	140	74.2	287.3	0.68	3.4
	80	176	78.4	362.1	0.86	4.3
	90	194	80.6	415.7	1.00	4.9
	100	212	83.0	487.2	1.14	5.8

TEMPERATURES AND TESTS FOR SYRUPS AND CANDIES.

Product	Temperature of syrup at Sea Level for desired concentration*		Test	Description of Test
	degrees C	degrees F		
syrup	110–112	230–234	Thread	When syrup is dropped from a spoon syrup spins a 2 inch thread
barfi fondant fudge penuche	112–115	234–240	Soft ball	Forms a soft ball when syrup is dropped into cold water; flattens on removal from water.
caramels	118–120	244–248	Firm ball	Forms a firm ball when syrup is dropped into cold water; does not flatten on removal from water.
divinity ladu marshmallow	120–130	250–266	Hard ball	Forms a ball which is hard enough to hold its shape when syrup is dropped into cold water.
butterscotch toffies	132–143	270–290	Soft crack	Forms threads which are hard but not brittle when syrup is dropped into cold water.
brittle glace	150–154	300–310	Hard crack	Forms threads which are brittle when syrup is dropped.
barley sugar	160	320	Clear liquid	sugar melts
caramel (burnt sugar)	170	338	brown liquid	sugar melts and browns.

*cook syrup 10°C lower for each 23 kilometers (900 ft) above sea level;
10°F lower for each 13 kilometers (500 ft) above sea level.

Vegetables

VEGETABLES may be classified as follows;—

Bulbs: garlic and onion

Flowers and Fruits: artichoke, brinjal (eggplant), broccoli, capcicum (sweet pepper), cauliflower, corn (maize), cucumber, drumstick, lady's finger (bhendi, okra), pumpkin, squash, and tomato.

Leaves and Stems: asparagus, cabbage, celery, coriander, brussels sprout, drumstick and all other types of green leafy vegetables and rhubarb.

Legumes: bean, lima bean, lentil, pea, and soy been.

Roots: beet, carrot, knolkhol (kohlrabi), parsnip, radish, sweet potato and turnip.

Tuber: potato.

VEGETABLE SELECTION, STORAGE AND USE. *Vegetables may be graded* according to appearance, decay, defects, and maturity. They may further be separated according to size.

Dehydrated vegetables: Such vegetables as carrots, potatoes, cauliflower, mushrooms, bitter gourd and beetroot may be sun dried or dried mechanically to remove their moisture content. Most processes remove from 15 to 25 percent of the moisture while freeze drying allows 2 percent to remain.

The quality of dried vegetables range from fancy to sub-standard. The size also ranges from very large to very small. Some may be graded according to size and quality, some according to size alone. Some may have no grading as to quality.

Dried vegetables may be dehydrated as fresh or green and those that are dried after maturity such as the seeds of legumes and cereals. Dehydrated vegetables should be clean, free of insects, have a good natural colour, and be of uniform size and quality.

FRESH VEGETABLE SELECTION, STORAGE AND USE: ARTICHOKE: Size does not indicate quality though being heavy in relation to size along with thick fresh appearing scales does indicate good quality. Mould, gray–black bruise, worm injury, large areas of brown, and spreading scales are all indications of poor quality artichoke.

ASPARAGUS: Fresh asparagus is crisp, tender, straight and it has compact tips. A rich green colour covers most of the spear. Medium and large spears are preferred. Avoid open, mouldy or decayed tips and ridged, irregular spears.

BEANS, GREEN OR SNAP: Select any of the varieties of beans with good colour and firm and tender pods crisp enough to snap. Avoid beans that are withered, have noticeable blemishes or decay and have thick overmature pods.

BEETROOT: Select firm, tender, deep red coloured beets with a smooth surface, round and medium to small in size with a slender main root. Avoid beetroot with wilted leaves, decaying top area, elongated shape and scaly or wilted surface.

BHENDI – see Lady's Fingers.

BRINJAL: Firm, heavy for size, smooth surface and a uniform colour are the characteristics of fresh brinjal. They may be black, green or purple in colour.

They may be small or large and somewhat oval in shape or long and slender. Avoid brinjal with rough, spongy places, indication of decay, or shrivelled surface.

BRUSSELS SPROUTS: The heads of fresh Brussels sprouts are free of blemishes and have bright green tight fitting outer leaves. Avoid brussels sprouts with yellowish, wilted or worm injured leaves.

CABBAGE: Varieties may be red, green with smooth leaves, or green with crinkly leaves. Outer (wrapper) leaves look fresh, have few blemishes and the head is firm with the cabbage heavy for the size. Avoid worm eaten, discoloured or dried looking cabbage. Separation of stems from the cabbage core is an indication of over-age.

CAPSICUM: (*sweet*) Select capsicum with a glossy surface, firm feel, and medium to dark green colour. Avoid sweet capsicum with light colour, thin walls, wilted or shrivelled look, soft watery spots or worm infestation.

CARROTS should be smooth, firm and a deep yellow-orange colour. Avoid carrots with green sunburned areas at the top, wilted appearance or feel or soft spots of decay.

CAULIFLOWER may be selected with fresh green leaves around white or creamy white compact heads. Avoid wilted, discoloured head (curd) or curd with decay, mould or insect injury.

CELERY stalks should be crisp and free of damage or stringiness. Celery may be white, light green or medium green. Pascal celery has succulent stems and tends to have limited stringiness. Avoid celery with discoloured or wilted leaves and stalks Inside surface of the outer stalks will have some gray or brown colour when the inner part of the celery is discoloured or insect damaged. Avoid also celery where the centre or heart branches are large and thick instead of small and tender.

CHICORY, ENDIVE, OR ESCAROLE: leaves should be crisp, and tender. The centre should be yellowish white or white, the outer leaves green unless they have been blanched. Avoid chicory, endive, or escarole, when the leaves have insect injury, are wilted or are discoloured (brown or yellow).

CHINESE CABBAGE: should have fresh light green leaves with crisp white centre stems. Avoid wilted chinese cabbage.

CORIANDER LEAVES should be fragrant, pale green, and free of wilt and decay. Avoid coriander leaves that have a yellowish or brown colour or are wilted.

CORN (MAIZE) husks should be green in colour with silk ends free of decay or worm injury and stem ends that are fresh and green. Corn ears are best if they are well covered with plump, soft kernels. Avoid corn ears with under developed kernels or grains and ears with depressed areas in the outer surface; also those with wilted, dry husks or worm infestation at the silk end.

CUCUMBERS should be firm, green and well formed. Those for slicing may be 6 to 9 inches long and those for pickling smaller. Avoid withered, or dull coloured over–large cucumbers. Cucumbers with shrivelled ends tend to be tough and bitter in flavour. Any worm infested cucumbers can be noticed by small brownish spots where the worms enter.

DRUMSTICK. Select drumstick with a fresh green colour, firm small cellulose side walls and 20 to 30 cms long. Avoid drumstick with pale green or brownish big fiber side walls.

GOURD should be firm and smooth surfaced. Avoid gourd which is limp, worm eaten, or of poor colour.

GREENS. Look for leaves that are tender, free of blemishes, and a fresh appearance. Avoid greens with coarse stems, wilted appearance and evidence of of insects.

LADY'S FINGER. Tender lady's finger will bend with very slight pressure at the tip, will be light green in colour and under 12 cm. in length. Avoid lady's finger with hard, fibrous, pale colour or very limp pods.

LETTUCE, HEAD Lettuce should be fresh, crisp, well trimmed and without wilt, decay or blemishes, and light green in colour. Heads should be slightly firm but not hard. In leaf lettuce, look

for fresh, free of blemish and tender leaves. Avoid wilted or damaged lettuce, leaf lettuce with a seed stalk, and head lettuce with an irregular hard bump indicating an overgrown central stem.

MUSHROOMS. The surface of the mushroom cap will be creamy white, white or light brown with light tan or pink gills beneath. Stems should not exceed 3½ cm in length with minimum diameter of 2½ cm. Mushrooms should be firm and free from bruises, decay and insect damage. Avoid mushrooms with dark discoloured gills, with wide and open caps, and those which are pitted or split.

OKRA. — see Lady's Finger.

ONIONS, GREEN AND LEEKS. Select bunches with fresh and crisp tops and firm white portions extending 7 to 10 cm. up from the root end. Avoid green onions or leeks with discoloured or wilted tops, seeds at the top, or woody centre of the white portion of the leek.

PARSLEY leaves should be deep green colour fragrant and free of wilt, decay and discolouration. Avoid wilted parsley or that with yellow leaves.

PEAS. Select peas with firm, tender, smooth, green pods and have the pods 3/5 to 4/5 filled with well developed peas. Avoid peas with decayed, mouldy or wrinkled, yellowish under or over filled pods.

POTATOES, WHITE. Select well shaped, medium to large potatoes, except new potatoes may be small and have some amount of skinned surface with unbroken surface free of sunburn. Avoid white potatoes with blemished skin, decay, green colour or withered skin.

POTATOES, SWEET. Sweet potatoes may be of white, red or yellow colour. They should be firm, free of black rot, blemishes and scars. They may be dry and mealy or moist depending on the variety. Avoid sweet potatoes that are irregular in shape, show signs of decay, are withered, or have worm holes.

RADISH (red or white). Select well formed, smooth, firm, radishes with fresh green tops. Small and medium sized radishes are best. Avoid large flabby and cracked radishes, also those with decayed tops.

RHUBARB. Select rhubarb stalks with medium thickness ; firm, small–string texture, and colour that is bright red with some light green near the top. Avoid very slender and very thick rhubarb stalks and those which are wilted.

SPINACH. – see greens.

TOMATOES. Select tomatoes which are smooth, firm, feel heavy for size having pink to red colour with no yellow or white spots, or deep yellow colour also without the spots. Avoid bruised or soft over–ripe tomatoes and those with sunburn, growth cracks, yellow/white spots, mould or decay.

TURNIPS. Select small or medium size turnips with firm, smooth skin. Avoid large or wilted turnips.

HOME STORAGE OF FRESH VEGETABLES (R = refrigerator ; C = crisper)

Vegetables	where stored	Temperature or location	Length of Time
Asparagus	R	C	1—2 days
beans, green	R	C	3—5 days
beetroot	R	C	1—2 weeks
bhendhi – see lady's finger			
bringal	room	15°C	1—7 days
brussels sprouts	R	C	1—2 days
cabbage	R	C	1—2 weeks
capsicum (sweet)	R	uncovered	3—5 days
carrot	R	C	1—2 weeks
cauliflower	R	C	3—5 days
celery	R	C	3—5 days
chicory, endive	R	C	1—2 days
chinese cabbage	R	C	1—4 days
coriander	R	C	1—2 days
corn (maize)	R	uncovered in husk	1—2 days
cucumber	R	C	3—5 days
drumstick	R	C	1—4 days
gourd	R	C	1—4 days
greens	R	C	1—2 days
lady's finger	R	C	1—2 days
lettuce	R	C	1—2 days
mushroom	R		1—2 days
onion & leeks, fresh	R	C	1—2 days
onions, dry	room	10°C–35°C	
parsley	R		
peas	R	C	1—2 days
potatoes, white	dark, dry place	07°C–10°C	6–9 months
	well ventilated	room temperature	1—7 days
potatoes, sweet	dark, dry place	room temperature	1—7 days
radish	R	C	1—2 weeks
rhubarb	R	C	2—4 days
tomatoes, ripe	R	uncovered	1—7 days
tomatoes, unripe	room	10°C–35°C	as ripen
turnip	R	C	1—5 days

COOKING VEGETABLES

Vegetables	Baking minutes	Boiling minutes	Steaming minutes	Pressure cooker (15 pounds pressure) minutes
Artichokes, whole	30 to 60	25 to 35	35	
Asparagus, whole or butts		10 to 20	12 to 30	1/2 to 2
tips		5 to 15	7 to 15	1/2 to 2
Beans, Lima, green		20 to 30	25 to 35	1 to 2
Beans, soy, green		20 to 30	25 to 35	1 to 2
Beans, snap, whole or				
1 inch pieces		15 to 30	20 to 25	2 to 3
Beets, new, whole	40 to 60	30 to 45	40 to 60	5 to 10
old, whole	40 to 60	45 to 90	50 to 90	10 to 18
Brinjal		10 to 20	15 to 20	
Brussels sprouts, whole		10 to 20	10 to 20	1 to 2
Cabbage, green, quartered		10 to 15	15	2 to 3
shredded		3 to 10	8 to 12	1/2 to 2
Cabbage, red, shredded		8 to 12	10 to 15	1/2 to 2
Carrots, young, whole	35 to 45	15 to 25	20 to 30	3 to 5
sliced	30 to 40	10 to 20	15 to 25	2 to 3
mature, whole	60	20 to 30	40 to 50	10 to 15
sliced		15 to 25	25 to 30	3
Cauliflower whole		20 to 30	25 to 30	10
flowerets		8 to 15	10 to 20	2 to 3
Celery, diced		15 to 20	25 to 30	2 to 3
Chard, Swiss		10 to 20	15 to 25	2 to 3
Corn, on cob		5 to 15	10 to 15	0 to 2
Greens		5 to 15		
Knol Khol, sliced		20 to 25	30	
Lady's Finger, sliced		10 to 20	20	3 to 4
Onions, small, whole		15 to 20	25 to 35	3 to 4
large, whole	50 to 60	20 to 40	35 to 40	5 to 8
Peas, green		8 to 20	10 to 20	0 to 1
Potatoes, white, medium,	45 to 60	25 to 45	30 to 45	8 to 11
whole				
quartered		15 to 25	20 to 30	3 to 5
Pumpkin, diced		10 to 20	25 to 35	3 to 5
Sweet Potatoes, whole	30 to 45	25 to 35	30 to 35	5 to 8
quartered,		15 to 25	25 to 30	6
Tomatoes	15 to 30	7 to 15		1/2 to 1
Turnips, whole		20 to 30		8 to 12
sliced		15 to 20	20 to 25	1 to 2

*The length of time required for a given vegetable to cook by any method cannot be stated exactly because of the variety and maturity of each, the length of time and the temperature at which the vegetable has been held since it was harvested, and the size of the pieces into which it has been cut. *Each vegetable should be cooked for the shortest time required to be palatable.*

**USE OF PRESSURE COOKER FOR VEGETABLE. At the end of cooking time, the pressure cooker should be placed in cold water or under running cold water to reduce the pressure quickly and stop the cooking, or, by reducing the cooking time by 5 minutes allow the vegetable to remain that length of time before reducing the pressure.

Cooking Frozen Vegetables. Since these vegetables are partially cooked in the blanching process they need only about half the cooking time of fresh vegetables. Frozen vegetables may be cooked directly from the frozen state except for corn on the cob. However, greens, asparagus and solidly frozen vegetables may be partially thawed and broken apart for more even cooking and use of a little less heat in the cooking process. Complete thawing causes shrinking, poor flavour, and loss of vitamin C in cut vegetables. Corn on the cob needs complete thawing before cooking (about four hours at room temperature). To prevent sogginess, the thawed corn may be stood on end in a dekshi or other pan containing about an inch depth of water. Cover and steam for 5 to 8 minutes.

Two fifths to 1/2 cup water is usually enough for cooking 1/2 litre (2 cups) frozen vegetables. The vegetable may be placed in a pan with rapidly boiling water and salt, the pan covered and water again brought to the boiling point (3–6 minutes required). Then vegetables may be separated with a fork, the heat reduced, and cooking carried out according to the table below.

COOKING TIMETABLE FOR FROZEN VEGETABLES

Vegetables	Cooking time	Vegetables	Cooking time
Artichoke	12–15 min	Corn, cut	3–6 min
Asparagus	5–10 min	Gorn on cob	5–8 min
Beans, green	12–15 min	Knolkhol	8–10 min
Beans, lima	15–20 min	Lady's Finger	15–20 min
Beets, sliced	to serving temp.	Mushrooms (in butter)	10–15 min
		Peas	5–8 min
Beets, whole	15–20 min	Potatoes, white	to serving temp.
Brinjal	4–10 min	Rhubarb	10–12 min
Brussels Sprouts	4–8 min	Sweet potatoes	to serving temp.
Carrots	5–8 min		
Cauliflower	3–6 min		

VEGETABLE PRESERVATION

Dried Vegetables. Dehydration of vegetables involves preparation of vegetables as for eating, blanching, treating with sulphur, and drying or drying without sulphite treatment in some cases and without blanching in others.

Maximum retention of natural green colour is possible in peas, split field beans, fenugreek leaves, and spinach by blanching in a boiling water solution with 0.1 percent magnesium oxide, 0.1 percent sodium carbonate and 0.5 percent potassium metalic sulphite (KMS). Other vegetables are given sulphite treatment immediately after blanching.

Ovens fitted with wire mesh trays which allow circulation of heat and escape of moisture produce desirable products provided the temperature is maintained as recommended. Generally about 8 kg. of vegetables may be dried in a square meter of drying area.

Dehydrated vegetables are stored in tins or jars that can be sealed air-tight. This may be sealed with solder or wax depending on the storage duration.

HOME DRYING TIMETABLE FOR VEGETABLES

Vegetable	Preparation	Pre-treatment	Maximum drying Temperature
Beans, field split	De-skin. Split by boiling in 1% sodium carbonate solution 5–7 minutes. Remove skin under running tap water	Blanch 2 min.	60°C
Beetroot	Peel. Cut 10 mm. slices	Blanch 10 min.	60°C
Bitter Gourd	Remove ends and cut into 6 mm. slices	Blanch 8 min.	60°C
Cabbage	Core and cut into 4 to 8 mm. shreds	Blanch 5 min. Sulphite in O. 25% KMS (O. 5 kg solution per kg. cabbage) for 10 min.	55°C
Carrots	Peel, cut 1 cm. slices	Blanch 3 min. Sulphite in O. 25% KMS (O. 5 kg solution per kg. carrots) for 100 min.	60°C

Vegetable	Preparation	Pre-treatment	Maximum drying Temperature
Caulifiower	Cut flowers into 10 mm. pieces	Blanch 5 min. Sulphite in 0.125% KMS (0.5 kg. solution per kg. cauliflower) for 10 min.	50°C
Fenugreek, leaves	Wash, remove stalks, stems	Blanch 2 min.	60°C
Garlic	Peel, cut 6 mm. shreds	Nil	55°C
Lady's Finger, sliced	Remove both ends and cut into 6 mm. slices with stainless steel knife	Blanch 4 min, sulphite in 0.25% KMS (0.5 kg solution per kg. slices) for 10 min.	60°C
small, whole (50–75 mm length)	Remove stem and slit lengthwise along ridges using stainless steel knife	Blanch 6 min.	60°C
Mushrooms	Wash	Nil	60°C
Onions	Peel, cut into 4–8 mm. slices	Nil	55°C
Peas, green	Pod, prick with pin	Blanch 3 min in boiling water with 0.5% KMS, 0.1% of magnesium oxide and 0.1% sodium bicarbonate.	60°C
Potatoes	Peel, cut 1 cm, slices	Blanch 3 min. sulphite in 0.125% KMS (0.5 kg solution per kg potato slices) for 10 minutes.	65°C
Pumpkin	Cut into 60 mm. wide lengthwise strips, peel, de-seed, prick with stainless steel fork, cut into 6 mm. cubes	Blanch 10 min.	65°C
Spinach	Wash, cut into 10 mm. pieces with stainless steel knife	Blanch 2 min	60°C

Adapted from : **Home-Scale Processing and Preservation of Fruits and Vegetables** published by Central Food Technological Research Centre, Mysore, 6th Edition, 1972, pp 44-46.

FRESH VEGETABLES PRESERVATION. Fresh vegetables are best when tinned or frozen soon after harvest and when they are at the best stage of maturity for cooking. Wash and drain vegetables before cutting or breaking the skin. Prepare and process as quickly as possible.

HOME TINNING TIMETABLE

Vegetable	Preheating*	PRESSURE COOKER AT 10 POUNDS (115°C) STEAM PRESSURE** In glass jars: half litre	In glass jars: litres	In Tins: R 10 Tins (No. 2 Tins)	In Tins: R 11 tins (No. 2½ tins)
Asparagus 2 cm pieces***	Boil 3 min	25 min	30 min	20 min	20 min
Beans, 2 cm pieces***	Boil 5 min	20 min	25 min	25 min	30 min
Beetroot, small whole or 1 cm. slices	Boil 25–30 min. or until skin slips easily	30 min	35 min	30 min	30 min
Carrots, diced***	Bring to boil	25 min	30 min	20 min	25 min
Corn, cream style***	Heat to boiling on cob	1¼ hrs		1 3/4 hrs	
Corn, whole kernel***	Heat to boiling on cob	55 min	1¼ hrs	1 hr	1 hr
Lady's Finger	cook 1 min	25 min	30 min	25 min	35 min
Mushrooms	Steam 4 min	30 min		30 min	
Green gram	Bring to boil	40 min	45 min	40 min	45 min
Peas, black-eycd***	Bring to boil	35 min	40 min	30 min	55 min
Peas green***	Bring to boil	40 min	40 min	30 min	35 min
Potatoes, small whole 2–5 cm.	Cook 10 min	30 min	40 min	30 min	35 min
Potatoes, diced, 1 cm.	Cook 2 min	35 min	40 min	35 min	40 min
Pumpkin, diced, 2 cm	Bring to boil	55 min	1½ hr	50 min	1¼ hr
Pumpkin sieved	Simmer until heated through	65 min	1 1/3 hr	1¼ hr	1½ hr
Spinach	Steam 10 min	70 min	1½ hr	1 hr 5 min	1¼ hr
Sweet Potato, dry pack, pieces	Boil 25 min	65 min	1½ hr	1 1/3 hr	1½ hr
Sweet potato, wet pack, pieces	Boil 20 min or until skin slips easily	55 min	1½ hr	1 hr 10 min	1½ hr

*Preheat in boiling water, steam, or own liquid according to recipe. Plunge vegetables into ice cold water to cool quickly and stop their cooking, keeping in the water the length of time they were blanched or scalded. Drain. Pack into jars or tins. Add for flavour ½ Standard Spoon salt to a ½ litre jar, 1 Standard Spoon to a litre jar. Cover vegetable with hot cooking liquid supplemented by boiling water as needed. Apply lids and process the specified length of time.

** Add ½ pound pressure for each 308 meters (1000 ft.) above sea level.

*** May be packed raw without pre-treatment.

FRESH VEGETABLE FREEZING TIMETABLE

Vegetable	Preparation	Blanching	Time
Artichoke	Trim bud and cone		9 min
Asparagus	Sort for stalk size Cut desired length	Small Medium Large	2 min 3 min 4 min
Beans, green	Remove ends, cut or leave whole		3 min
Beans, butter lima shell	Shell, sort for size	Small Medium Large	2 min 3 min 4 min
Beetroot	Cook, peel, dice, slice or leave whole	 Small	30 min 45 min
Brussels Sprouts	Trim. sort for size	Medium Small Medium	3 min 4 min 5 min
Carrots	Scrape, slice, dice or leave whole	Large	3 min
Cauliflower	Break or cut into 2 cm. pieces		
Corn, cream-style	Husk, silk, wash, blanch, cut kernels at centre then scrape cob to remove remainder	 Small	3 min 4 min 7 min
on cob	Husk, silk, wash, sort for size	Medium Large	9 min 11 min
whole kernel	Husk, silk, wash blanch, cut kernels at about 2/3 depth		
Greens	Remove tough stems		4 min
Knolkhol	Peel, dice in 1 cm. cubes		2 min
Lady's finger	Remove stems without breaking pod.		1 min
Peas, black eye green	Shell, sort for size tenderness	black eye green	2min
Potatoes, white	Bake, mash return to skin		by recipe
Pumpkin	Peel, dice	Pre-cook, sieve, cool,	4 min
Rhubarb	Blanch. pack raw or pack in 40%syrup		4 min
Soy bean	Pre-cook 5 min in pod, chill, hull, freeze		
Sweet Potatoes	Halve, slice or puree after cooking unpeeled to about 3/4 done	Dip halves or slices in 3 S lemon or lime juice to ½ C water	
Tomatoes	Stew or make into juice		cook, freeze

Blanch 1 minute more at 15 meters (5000ft.) or more above sea level

ENGLISH—INDIAN LANGUAGES GLOSSARY*

AMLA (Phyllanthus emblica)
B, G, H, M—Amla ; K, Ma, Ta—Nelikkai Te—Usrikai ; O—Anla.

APRICOTS (Prunus armeniaca)
H—Chila, khubaini, priyalu.

ARAI KEERAI (Amaranthus tristis)
Ta—Arai keerai

ASH GOURD—(Benincasa hispida)
Ta—Kalyana pusani, Sambal pusani ; Te—Budedha gummidi ; K-Budu-gumbala ; O-Panika-kharu H. M-Kohala ; B-Chal kurma; Ma-Elawan, kumbelanga.

BAJRA (Pennisetum typhoideum)
B, G, H, M, O—Bajra ; Ta-Cambu ; Te-Gentelu Ma-Kamboo.

BANANA (Musa paradisiaca)
Ta—Poovan vazhai ; Te-Arati pandu ; K-Bale ; O-Chamba kadali ; Ma-Vaza pazham ; B, G,H, M-Kela

BARLEY (Hordeum vulgare. L)
H—Jau ; O-Jaba Dhanna ; M-Juv; B-Job; G-Jan; Ma-Yawam ; Ta, Te-Barli.

BEANS (Dolichos lab lab var. typicus)
H—Sem ; B-Shim ; G-Bal ; M-Pavata ; Te-Chikkudu ; Ta-Avarai, K-Chapparada avare ; Ma-Avara.

BEANS, LIMA (Phaseolus lunatus)
B—Cimra.

BEETROOT (Beta Vulgaris)
H—Chukandri; B-Bitpalang; K-Beetroot gadde ;

BENGAL GRAM (Cicer arientum)
H—Chana ; Ta-Muzhu ; kadalai ; Te-Sanagalu.

BITTER GOURD (Memordica Charatia)
H—Karela ; Ta-Pavakkai ; Te-Kakara ; K-Hagalkai ; O-Badakalara ; G, M-Karle ; B-Karala.

BRAN (oryza sativa)
K, Ma, Ta, Te-Thavidu ; O-Nali ; K-Konda ;

BRINJAL (Solanum melongena)
H, O—Baingan ; Ta-Kathrikai Te-Vankayi, K-Bedane ; M-Vange, B-Begun ; G-Ringna; Ma-Vazhuthinonga.

CABBAGE (Brassica cleracea, var. capitata)
H—Band gobi ; B-Palang ; K-Kosugedde.

CARAWAY (Carum carvi)
H—zira ; shaijira ; B-Jira ; G-Shajira ; M-Shahajira ; Te-Shimaisapu ; Ta-Kekkuvirai ; simaishembu.

CARDAMOM (Elettaria cardmomum)
H—Illayechi ; B-Elaich ; G-Yelachi ; itachi ; M-Vellode; Te-Elaki; Ta-Elakkai; K-Elakki; Ma-Elakkaya; O-Ela, Olaicno.

CARROT (Daucus carota var. sativa)
H, B, G-Gajar ; M Gazara ; Te-Gajjaragedda ; pitakanda ; Ta-Gajjara kilangu karettu kizhangu; K-Gajjari.

*B—Bengali H—Hindi P—Panjabi
K—Canarese M—Marathi Ta—Tamil
G—Gujarati Ma—Malayali Te—Telugu
O—Oriya

CASHEW NUTS (Ancardium occidentale)
G, H, M–Kaju; Te–Jeedi pappu; K–Geru pappu; O–Lanka ambumanji; B–Hijli badam; Ma–Parangiynadi

CAULIFLOWER (Brassica oleracea var. botrytis)
H–Phul gobi; Te–Kosuggada; K–Hookosu; Kobigadde; Ta–Kovippu.

CHERRIES (Prunus cerasus)
P–Gilas, olohi.

CHILLIES (Capsicum prutecenes)
H, M–Mirch hari; Ta–Pachai milagai ; Te–Pachai mirapakai; K–Hari menesinakai; B, O–Kanchalanka; G–Lilamarche; Ma–Pachamulaku.

CHILLI, RED (Capsicum annum)
H–Lalmirch;* B–Lalmorich; G–Lalmirich; Te–Sudmirapakaya; Ta–Usimalagay; K–Menasinakayi; Ma–Chalie todachina, mulaku.

CHOLAM (Sorghum vulgare)
H–Jnar, Janera; Te–Jonnalu; K–Jola; O–Janka; M–Jwari: B, G–Juar.

CHOW CHOW (Sechium edule)
Ta–Seemai Kathrikai; K–Seema badans; O–Phutikakudi.

CINNAMON (Cinnamomum zeylanicum)
H, B, G, and M–Dalchini; Te–Lavangapatta; Ta–Illavangapattai, Karuva; K–Dalchini; Ma–Cherizila-vannam, erikkolam. ilavangam.

CLOVE (Eugenia caryophyllata)
H–Laung, long; B, G, M–Lavang; Te–Karavappu; Ta–Kirambu; lavangam; K–Lavanga.

CORIANDER (Coriandrum sativum)
H–Dhania, dhanya; B–Dhane; G–Dhanya, Kothamir; M–Dhanya, kothmur; Te–Danyalu, kotimuri; Ta–Kotamali; K–Kotambari; Ma–Kothumpalari.

CORN * see MAIZE

CURRY LEAVES (Murraya koenigli)
H–Gandhela; Ta–Karuveppilai; Te–Kariyepallu; K–Kari peru; M–Kadhi limb; B, O–Bursunga; G–Mitha limbado.

CUSTARD APPLES (Annona squamosa)
H-Sharifa; Ma, Ta, Te-Seetha pazham; G, K, M-Seetha Pala; B, O-Ata.

DATE (Phoenix dactylifera)
H, B, G-Khajur; M, K-Kharjur; T–Kharjuramu, Ta–Karchuram; Ma–Ittapalam; O–Khorjjuri.

DRUMSTICK (Moringa oleifera)
H–Saija; Ma, Ta–Murungaikai; Te–Munagakada; K–Murigi; B, O–Sajama Chhuin; M–Shevuga sheng G–Saragavo.

DRUMSTICK, LEAVES (Moringa oleifera)
H, M–Saijan; K, Ta, Te–Murungi keerai O, M–Sajana; B–Shevugapan; G–Saragawo.

EGGPLANT-see BRINJAL

FENUGREEK (Trigonella goenum-graecum)
H, P, G–Methi; Te–Mentula; Ta–Ventayam; K–Menthya; Ma–Venthiam, uluva.

FENNEL (Foeniculum vulgare)
H–Bari saunf; B–Mauri, panmuhori; G–Variari variyali; M–Badishep; Te–Peddajilakaram; Ta–perunjiragam sohikirai; K–Badi soppu

FIG (Ficus carica)
H,B,G,M- Anjir; Ta–Simaiyatti, tenatti; K–Anjura; Ma–Simayatti; O–Pushposhunyo; Te–Anjuru.

GARLIC (Allium sativum)
M, B, G, M–Lasan, lasun; T–Vellulli; Ta–Vellaippundu, K–Bellulli; Ma–Vellulli.

GINGELLY (Guizotia abyssynica)
H–Kalatil, ramtil, surgiya; B–Ramtil, sirguja; G–Kalatil, ramtel; M–Khursani, karale; T–Verrinuvvulu; Ta–Payallu, uchellu; K–Huchhellu, guruellu.

GINGER (Zingiber officinaee)
H–Adrak; Ma, Ta–Inji; Te–Allam; K–Shunti; O–Ada; G,M–Ale; B–Deshi.

GRAPE (Vitis labru–sianavinigera)
B, H, O–Anjur; Ta, Te–Nila drakshai; G, K, M–Drakshi, Ma–Mudirinla (Neela fathi).

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* B – Bengali
K – Canarese
G – Gujarati
H – Hindi
M – Marati
Ma – Malayali
O – Oriya
P – Panjabi
Ta – Tamil
Te – Telugu

GRAPE FRUIT (Citrus paradisi)
H-Chakotra; B-Batavinebu, chakotra; G-Chakotru; M-Panis, papanasa; Te-* Pampalamasam; Ta-Pambalimasu; K-chakkotra Ma-Bambirinarakam, pamparamasam

GROUND NUT (Araichis hypogea)
H-Moongphali; Ta, Ma-Nilak-kadalai; K-Kadala kayi; M-Bhuimoog; B, O-China badam; G-Bhoising.

GUAVA (Peidium guajava)
H–Anrud; Ta-Koyya pazham: Te-Jami Pandu; K-see kai; O-Desipijuli; M-Peru; G-Payara; Ma-Jam phal.

JAMBU (Syzigium cumini)
H–Jaman; Ta-Naga Pazham; Te-Neredu Pandu; K-Nerali; O-Jamukoli; M-Jambphool; B-Kalojam.

JACKFRUIT (Arto carpur hetero phyllus)
G, H-Kathal; Ta-Pala pazham; Te-Panasa pandu; K-Halasu; M, Ma, O-Phanas.

JEERA (Cuminum cyminum)
H–Zira; B–Jira; G–Jiru; M–Jiregire; Te–Jilakarra; jiraka; Ta–Shiragam; K-Jirge; Ma-Jirakam.

KNOL KHOL (Brassica causorapa).
H-Kohl; B, O-Ulkobi; Ma-Moolakhol.

LADY'S FINGER (Hibiscus esculentus)
H-Bhindi; B-Dheras; G-Binda; M-Bhendi; Te-Venda; Ta-Vendai; K-Bende; Ma-Venda.

LEMON (Citrus limon)
H-Meatha neebu; K, Te-Gajanimma pandu; O-Kagaji-lembe; M–Limbu; B-Misti lebu; G-Motu limbu ; Ma-Poonaranga.

LETTUCE (Lettuca sativasalad)
B, G-Salad pala; Ma-Uvarcheera.

LIME (Citrus aurantifolia)
H - Neebu; Te - Nimmapandu ; K-Nimbe; O-Ganeakulia lembu; B-Lebu; G-Kadji limbu: Ma-Charu naranga; Ta-Elimicham bazham.

LITCHI (Litchi cninensis)
H-Lichi; Ta-Illichi; K-Litchi; O-Lishi.

MACE (Myristica fragrans)
T, K-Jajipatri ; O-Jaitri, Joyotri.

MAIZE—see CORN

MANGO (Mangifera indica)
B, H-Am; Ta-Mambazham; Te-Mamidipandu; K-Mavina hannu; M, O-Amba; G-Keri; Ma-Mampazham.

MINT (Mentha spicata)
B, G, H, K, M, O, Ta, Te–Pudina, Pothina.

MUSTARD LEAVES (Brassica cam pestrisvarsarson)
H.—Sag sarson.

NIGELLA (Nigella sativa).
H-Kalajira, B-Kalajira; mungrela; G-Kalanjijiram; Te-Nellajeera Kaira; Ta-Karunjiragam; K-Karijirage; Ma-Karunjirakam.

OKRA–See LADY'S FINGER.

ONIONS (Allium cepa)
H-Piyaz; B-Pyanj; G-Dungari; M-Kanda; Te-Nirulli ulligadalu; Ta-Vengayam; K - Nirulli, Chuvannaulli.

ORANGE (Citrum aurantium)
H-Ma-Narangi; Ta-Kichili pazham ; K-Kithilai; B, O, Te-Kamala; M-Samtre.

PAPAYA (Carica papaya)
H-Papita; Ta-Papali; K-Pharangi; O-amrukkanda.

PEACHES (Any of dalis persice)
H-Arhuaadoo; K-Masa sebu; O-Diccmu.

PEAS (Pisum sativum)
H, O-Matar; Ma, Ta-Pattani; K, Te-Battani ; G, M-Vatana; B-Motor.

PEPPER, BLACK (Piper nigrum)
H-Golmirch, kalimirchi; B-Golmirch, kalamorich, muricha; G-Kalomirch; M - Kalmirich, mire; Te-Marichami mairyamu; Ta-Aguttam, arisa; irambivam kallinai, marisam, milaga, sevviyam sur uchiram; K-Menasu; Ma-Kolakam, kurumu aka maricham, uchiram; O-Golom irich moricho.

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* B–Bengali, H–Hindi, P–Panjabi, K–Canarese, M–Marathi, Ta–Tamil, G–Gujarati, Ma–Malayali, Te–Telugu, O–Oriya

PETHA (Benincasa bispida)
H-Petha; B-Chalkumra, kumra; G-Bhurukola; M - Kohala; T - Budidegummadi; Ta- Pushanikkai; K-Budakumpalakayi; Ma-Kumpalam, kumpalanga.

POMEGRANATE (Punica grantum)
H-Anar, Ta-Madalam pazham; Te-Dalima pandu; K-Dalimbari; B, G, O, M-Dalimb; Ma-Kappanga.

POTATO (Solanum tuberosum)
H-Alu; B-Golalu, belathi aloo; G-Papeta; M-Betata; Te-Urlagadde; Ta-Urlakalanga; K-Aloogadde.

POTATO, SWEET (Ipomoea batatas)
H-Mitha alu, shakarkand; B-Lalalu, ranga alu; G-Kannagi; sakaria; M-Ratalu; Te-Chellagadda; Ta - Sakkaravelleikilangu; K - Genasu; Ma - Chakkare kilangu; O-Kanda.

PUMPKIN (Cucurbita pepo)
H-Kadimah; konda sitaphal; B-Kadimah, konda kumra ; G-Dudia; M-Kohala; K-Kumbala; Ma-Panikakharu.

RADISH (Raphanus sativus)
H-Muli; K, Ma, Ta, Te-Mullangi; O-Dhala mula; B. M-Mula, G-Safed mule;

RAGI (Eleusine coracana)
H-Mundal; O-Mandia; M-Nachmi; B-Marua ; Ma-Moothari.

RAISINS (Vitir vinifera)
H - Kishmaish ; Ta-Kodimunthri ; K-Drakshi ; B,G,O, Te - Kismis; M-Mamika; Ma - Unakku mundringa.

REDGRAM (Cafanius cajan)
G, H, K, M, Ma, Te-Ashardhar tur dhal; Te-Kandi pappu; O-Harada; B-Arhar dal.

RICE (Oryza Satiya)
H, B, O-Chawal; Ta-Arisi; Te-Biyyam; K-Akki; M-Ukda; G-Chokha; Ma-Ari.

RIDGE GOURD (Luffa acutangula)
G, H-Tarai; Ta-Pirkkamkai; Te-Beerakai; K-Heeraikai; O-Janhi, M-Dodka; B-Jhinga.

SARSON (Brassica campestris var. sarson)
H-Sarson; B-Sarisa.

SNAKE GOURD (Trichoranther)
H-anguine.

SOY BEANS (Glycine max meer)
H-Bhat; B-Garikalai.

SPINACH (Spinacia oleracea)
H-Isanag, pinnis, sagpalak; B-Palang. pinnis; Te-Dumpabachhali; matturbacchali; Ta-Vasaiyilaikkirai.

SUPOTA (Achras zapota)
H-Sapotu.

TAMARIND (Tamarindam indica)
H–Imli; Ma, Ta-Puli; Te-Chintha pandu; K-Himse hannu; O-Tentuli; M-Chinch; B-Tetul; G-Amli.

TAPIOCA (Manihot esculenta)
H-Simla alu; Ta-Maravalli Khizangu; Te-Karra penda lam.

TOMATO (Lycopersicon esculenbum)
H-Vilayeti baingan; Ta-Thakkali pazham; Te-Seemavanga pandu; K-Chappara chande; O-Bilati baigane.

TUMERIC (Curcuma longa)
H, B-Haldi; G-Haladu; M-Halade; Te-Pasupu; Ta-Manjal; K-Arishina; Ma-Manjal, marinalu.

TURNIP (Brassica rapa)
H-Salgam; M-Shiras.

WALNUT (Juglans regia)
B, G, H, M, O-Akhrot; Ta-Nattu akrotu kottai; Te-Nattu akhrotu vittu; Ma-Akshodakkai.

WHEAT (Triticum aesturim)
H, M-Gehum; Ta-Godumai: Te-Godhvmalu; K-Godhi; Q-Gahana; B-Gom; G-Ghan; Ma-Gothambu.

YAM (Typhonium trilobatum)
H, G-Ratalu; Ta-Kuruni kizhangu; Te-Kanda; K-Chikka swarna gaddu; O-Khamba alu; B-Chet kachu ratalu; Ma-Chena (sadharna).

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* B – Bengali
K – Canarese
G – Gujarathi
H – Hindi
M – Marathi
Ma – Malayali
O – Oriya
P – Panjabi
Ta – Tamil
Te – Telugu

INFORMATION REFERENCES

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ALL INDIA FOOD PRESERVERS' ASSOCIATION, Bangalore 560016

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Hapur, U. P.

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Agriculture and Food Products Division Council and Consumer Products Division.
Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110001

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